



ONLINE CONDITION MONITORING SOLUTIONS



LEADING THE WAY

IN ASSET INTEGRITY MANAGEMENT & INDUSTRIAL SOLUTIONS

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SOUTH AFRICA

ZAMBIA

DEMOCRATIC REPUBLIC OF CONGO

MADAGASCAR

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CHINA



DGC AFRICA, a division of the Dickinson Group of Companies, is a leading provider of asset management solutions across sub-Saharan Africa. With a rich heritage spanning 115 years, **DGC AFRICA** has established itself as a trusted partner in the mining, metals smelting, mineral processing, and various other heavy industries.

OUR COMPREHENSIVE RANGE OF SERVICES
**INCLUDES CUTTING-EDGE
ONLINE CONDITION
MONITORING SOLUTIONS**
THAT ENSURE THE TECHNICAL INTEGRITY,
OPERATIONAL EFFICIENCY, AND SAFETY
**OF A WIDE RANGE OF ASSETS
THROUGHOUT THEIR LIFECYCLE.**

DGC AFRICA's commitment to innovation, safety, and customer-centric solutions has positioned us at the forefront of industrial services in Africa.

In today's fast-paced industrial environment, every second counts. Unplanned downtime can result in significant financial losses, safety risks, and environmental hazards. **Our Online Condition Monitoring solutions** provide you with real-time insights into your assets' health, allowing you to transition from reactive to predictive maintenance strategies.



PARTNERING FOR EXCELLENCE: DGC AFRICA & EAMS

To further enhance our **Online Condition Monitoring** capabilities, **DGC AFRICA** has formed a strategic alliance with **EAMS Africa (EAMS)**. **EAMS** is a recognized leader in asset management software and consulting services, bringing cutting-edge technology and international best practices to our monitoring solutions.

This powerful partnership combines **DGC AFRICA's** deep understanding of African industrial landscapes with **EAMS's** innovative software solutions and global expertise. Together, we offer a unique blend of local knowledge and world-class asset management capabilities, providing our clients with unparalleled support in optimizing their asset performance, reducing risks, and driving operational excellence.

AT DGC AFRICA AND EAMS,
OUR ONLINE CONDITION MONITORING SOLUTIONS
**ARE DESIGNED TO ENHANCE
PERFORMANCE, SAFETY, AND
RELIABILITY OF CRITICAL INDUSTRIAL ASSETS
ACROSS DIVERSE SECTORS.**
LEVERAGING STATE-OF-THE-ART TECHNOLOGY
AND DEEP INDUSTRY EXPERTISE,
OUR COMBINED TEAMS DELIVER SPECIALIZED AIM SERVICES
**TAILORED TO THE UNIQUE CHALLENGES
OF EACH FACILITY.**



OUR COMPREHENSIVE ONLINE CONDITION MONITORING SOLUTIONS



REAL-TIME DATA ACQUISITION / **ADVANCED ANALYTICS AND MACHINE LEARNING**
CUSTOMIZABLE DASHBOARDS AND ALERTS / **INTEGRATION WITH EXISTING SYSTEMS**
SCALABLE CLOUD-BASED SOLUTIONS / **VIBRATION ANALYSIS** / **OIL ANALYSIS**
THERMOGRAPHY / **ULTRASONIC TESTING** / **MOTOR CURRENT SIGNATURE ANALYSIS**

REAL-TIME DATA ACQUISITION



CONTINUOUS MONITORING
OF CRITICAL
ASSET PARAMETERS
FOR IMMEDIATE INSIGHTS

Our Real-Time Data Acquisition service forms the foundation of our Online Condition Monitoring process. Using advanced sensors and data collection systems, we create a constant stream of information about your assets' performance and health.

WE EMPLOY A MULTI-FACETED APPROACH TO DATA ACQUISITION:

- **High-frequency data sampling** to capture even the most subtle changes in asset behavior
- **Multi-parameter monitoring**, including vibration, temperature, pressure, and electrical signals
- **Wireless sensor networks** for hard-to-reach or moving components
- **Integration with existing control systems and historians** for a holistic view of asset performance

This comprehensive approach ensures that every critical parameter is monitored continuously, providing a solid basis for analysis and decision-making. Our process minimizes the risk of unexpected failures while maximizing the accuracy and completeness of the data collected, giving you unprecedented visibility into your assets' real-time condition.

ADVANCED ANALYTICS & MACHINE LEARNING

Our Advanced Analytics and Machine Learning service goes beyond simple data collection. Our team of data scientists and engineers employs sophisticated algorithms to process vast amounts of data, identifying patterns and predicting potential issues before they occur.

KEY FEATURES OF OUR ANALYTICS APPROACH INCLUDE:

- **Anomaly detection algorithms** to identify deviations from normal operating conditions
- **Predictive modelling** to forecast asset degradation and potential failures
- **Machine learning algorithms** that continuously improve prediction accuracy over time
- **Root cause analysis tools** to help identify the underlying causes of asset issues
- **Performance optimization models** to maximize asset efficiency and output

We analyse historical data, current performance metrics, and environmental factors to create accurate predictive models. This comprehensive analysis forms the basis for our predictive maintenance recommendations, ensuring that every decision is backed by solid data and advanced analytics. By leveraging these cutting-edge techniques, we help you move from reactive to proactive maintenance, significantly reducing downtime and maintenance costs.

LEVERAGING CUTTING-EDGE
ALGORITHMS
FOR PREDICTIVE MAINTENANCE
& PERFORMANCE
OPTIMIZATION



CUSTOMIZABLE DASHBOARDS & ALERTS

PROVIDING INTUITIVE
INTERFACES
FOR EASY DATA
INTERPRETATION
& TIMELY NOTIFICATIONS



Our **Customizable Dashboards and Alerts service** transforms complex data into easily understandable visual representations. We create user-friendly interfaces that allow your team to quickly grasp the current state of your assets and make informed decisions.

OUR DASHBOARD SOLUTIONS OFFER:

- **Real-time asset health indicators** and key performance metrics
- **Customizable views for different user roles** (operators, maintenance teams, management)
- **Interactive data visualization tools** for trend analysis and performance comparisons
- **Mobile-friendly designs** for on-the-go monitoring and decision-making

The alert system is tailored to your specific needs, ensuring that the right people are notified immediately when potential issues are detected.

FEATURES INCLUDE:

- **Multi-channel notifications** (email, SMS, push notifications)
- **Escalation procedures** for critical alerts
- **Customizable alert thresholds** based on your operational parameters
- **Integration with work order management systems** for streamlined maintenance processes

This proactive approach allows for swift action, minimizing downtime and preventing minor issues from escalating into major problems. By providing clear, actionable information, our dashboards and alerts empower your team to make data-driven decisions and maintain optimal asset performance.



INTEGRATION WITH EXISTING SYSTEMS



ENSURING SEAMLESS
DATA FLOW
BETWEEN ONLINE
CONDITION MONITORING
& YOUR CURRENT
INFRASTRUCTURE

Our **Integration service** guarantees that our Online Condition Monitoring solutions work harmoniously with your existing systems. We conduct thorough analyses of your current infrastructure, ensuring that new monitoring components are fully compatible with your CMMS, ERP, and other operational systems.

OUR INTEGRATION APPROACH INCLUDES:

- **Development of custom APIs and data connectors** for seamless information exchange
- **Real-time synchronization of asset health data** with maintenance management systems
- **Integration with production planning systems** to optimize maintenance scheduling
- **Secure data transfer protocols** to maintain the integrity and confidentiality of your information
- **Scalable architecture** to accommodate future system upgrades and expansions

This service minimizes disruption during implementation and ensures smooth operation post-integration. We also provide comprehensive documentation and training to ensure your team is fully equipped to leverage the integrated systems effectively. By creating a unified ecosystem of asset management tools, we help you maximize the value of your existing investments while enhancing your overall maintenance and reliability capabilities.

SCALABLE CLOUD-BASED SOLUTIONS

Our **Scalable Cloud-Based Solutions service** offers a future-proof approach to Online Condition Monitoring. We implement secure, cloud-based systems that can grow with your needs, allowing you to start with critical assets and expand your monitoring capabilities over time.

KEY FEATURES OF OUR CLOUD-BASED SOLUTIONS INCLUDE:

- **Elastic computing resources** that automatically scale with your data volume and processing needs
- **Multi-tiered data storage** for optimal balance of accessibility and cost-effectiveness
- **Advanced encryption and access control** to ensure data security and compliance with industry standards
- **Automated backup and disaster recovery mechanisms** to protect your valuable asset data
- **Regular software updates and feature enhancements** without system downtime

PROVIDING FLEXIBLE,
**SECURE,
& EASILY**
EXPANDABLE MONITORING
CAPABILITIES

This scalable approach ensures that you can always access your data from anywhere, at any time, while benefiting from regular updates and improvements without system downtime. Our cloud solutions are designed with the highest security standards to protect your valuable data, giving you peace of mind as you leverage the power of online condition monitoring.

COMPREHENSIVE ONLINE CONDITION MONITORING SOLUTIONS

At DGC AFRICA and EAMS, we offer a suite of cutting-edge Online Condition Monitoring techniques designed to provide real-time insights into the health and performance of your critical assets.

Our comprehensive approach combines Vibration Analysis, Oil Analysis, Thermography, Ultrasonic Testing, Motor Current Signature Analysis to create a holistic view of your equipment's condition.

By leveraging these advanced technologies, we can detect potential issues at their earliest stages, predict future performance, and optimize maintenance strategies. This multi-faceted monitoring approach enables you to transition from reactive to predictive maintenance, significantly reducing downtime, extending asset life, and improving overall operational efficiency.

Whether you're managing rotating equipment, electrical systems, or complex industrial processes, our integrated Online Condition Monitoring solutions provide the data-driven insights you need to make informed decisions and maintain peak performance across your entire operation.



VIBRATION ANALYSIS

Our **Vibration Analysis** service uses advanced sensors and analytical tools to monitor the vibration patterns of your rotating equipment. By detecting subtle changes in these patterns, we can identify developing issues such as misalignment, imbalance, or bearing faults long before they cause significant damage.



**DETECTING
& DIAGNOSING
MECHANICAL
ISSUES**
IN ROTATING EQUIPMENT
BEFORE THEY LEAD
TO FAILURES



TECHNICAL DETAILS

- **High-sensitivity accelerometers** and velocity sensors for data collection
- **Advanced signal processing techniques** including FFT analysis and wavelet transforms
- **Automated pattern recognition** algorithms for fault identification
- **Continuous monitoring capabilities** with real-time data streaming

SPECIFIC APPLICATIONS

- **Bearing defect detection** in electric motors, pumps, and gearboxes
- **Impeller and fan blade condition assessment** in centrifugal equipment
- **Shaft alignment monitoring** in coupled machinery
- **Gear tooth wear analysis** in industrial gearboxes

BENEFITS

- **Early detection of mechanical faults**, reducing unexpected breakdowns by up to 70%
- **Extended equipment life** through timely interventions
- **Improved energy efficiency** by maintaining optimal machine condition
- **Enhanced production quality** by minimizing vibration-induced process variations

OIL ANALYSIS



Our Oil Analysis service provides crucial insights into the health of your equipment's lubrication systems. By regularly analysing oil samples, we can detect wear particles, contaminants, and changes in oil chemistry that indicate developing problems.

TECHNICAL DETAILS

- **In-line oil sensors** for continuous monitoring of key parameters
- **Particle counting and classification** using laser particle analysers
- **Spectrometric analysis** for wear metal detection
- **Viscosity and oxidation measurements** for oil condition assessment

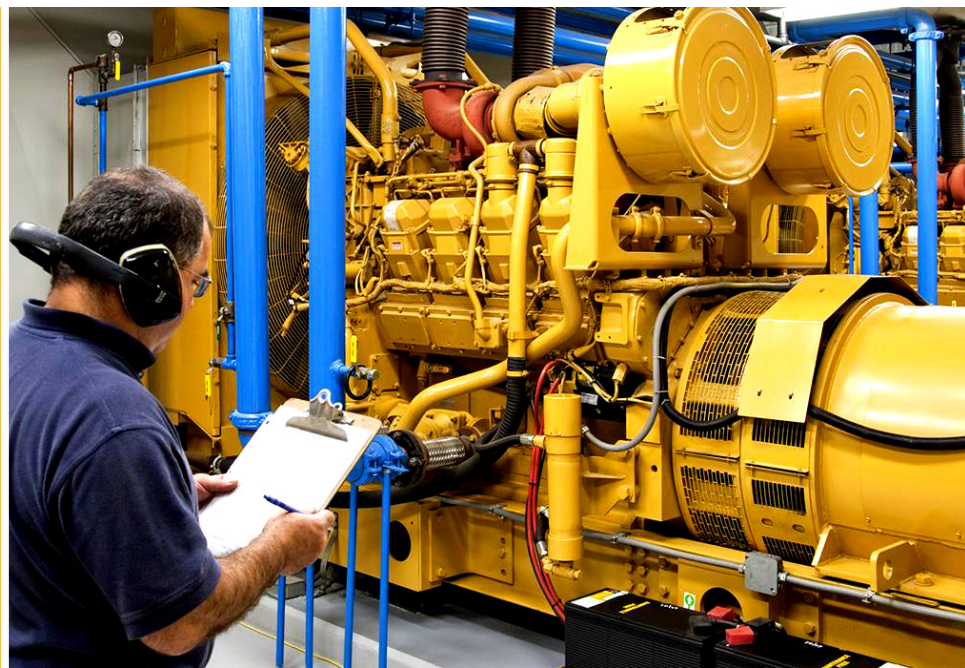
SPECIFIC APPLICATIONS

- **Engine oil condition monitoring** in heavy machinery and power generation equipment
- **Hydraulic system contamination control** in manufacturing and mobile equipment
- **Gearbox oil analysis** in wind turbines and industrial drives
- **Transformer oil monitoring** for electrical grid reliability

BENEFITS

- **Early warning of equipment wear**, potentially reducing repair costs by up to 50%
- **Optimized oil change intervals**, reducing lubricant consumption and waste
- **Improved equipment reliability**, with up to 30% reduction in lubricant-related failures
- **Enhanced environmental compliance** through proper oil management

**MONITORING
LUBRICANT
CONDITION
& CONTAMINATION
LEVELS TO OPTIMIZE
MACHINE PERFORMANCE
& LONGEVITY**



THERMOGRAPHY

Our **Thermography service** uses state-of-the-art infrared cameras to detect temperature anomalies in your equipment. This non-invasive technique can identify issues such as overloading, poor connections, or insulation failures in electrical systems, as well as mechanical issues that generate excess heat.

TECHNICAL DETAILS

- **High-resolution infrared cameras** with sensitivity as low as 0.03°C
- **Automated temperature threshold alerts** for real-time monitoring
- **Integration with visual imaging** for easy problem localization
- **Advanced thermal pattern recognition** for specific fault identification

SPECIFIC APPLICATIONS

- **Electrical panel and switchgear inspection** for hotspot detection
- **Mechanical equipment bearing and coupling temperature monitoring**
- **Refractory lining integrity assessment** in high-temperature processes
- **Steam system efficiency analysis** through steam trap inspection

BENEFITS

- **Prevention of electrical fires**, potentially saving millions in property damage
- **Reduced energy waste** by identifying and rectifying inefficient thermal processes
- **Improved worker safety** by detecting potential failure points before they become hazardous
- **Extended equipment life** through early detection of overheating components





DETECTING LEAKS, ELECTRICAL DISCHARGES, & MECHANICAL WEAR IN VARIOUS TYPES OF EQUIPMENT



ULTRASONIC TESTING

Our **Ultrasonic Testing service** uses high-frequency sound detection to identify issues that are often undetectable by other means. This includes compressed air leaks, valve leakages, and early-stage bearing faults.

TECHNICAL DETAILS

- **Wide-range ultrasonic sensors** (20 kHz - 100 kHz) for versatile fault detection
- **Acoustic imaging capabilities** for precise leak localization
- **Integration with vibration data** for comprehensive rotating equipment analysis

SPECIFIC APPLICATIONS

- **Compressed air and gas leak detection** in industrial plants
- **Valve leak quantification** in process pipelines
- **Partial discharge detection** in high-voltage electrical equipment
- **Early-stage bearing fault detection** in low-speed machinery

BENEFITS

- **Significant energy savings** through prompt detection and repair of air leaks
- **Improved process efficiency** by ensuring proper valve operation
- **Enhanced electrical safety** through early detection of insulation breakdowns
- **Reduced downtime** by catching bearing faults at the earliest stages





MOTOR CURRENT SIGNATURE ANALYSIS

Our **Motor Current Signature Analysis service** provides a non-invasive way to assess the condition of electric motors. By analysing the electrical current patterns, we can detect issues such as broken rotor bars, air gap eccentricity, or winding faults.

TECHNICAL DETAILS

- **High-resolution current transformers** for accurate current waveform capture
- **Advanced spectral analysis techniques** including Park's Vector approach
- **Automated fault classification** using machine learning algorithms
- **Integration with motor control centres** for comprehensive motor fleet management

SPECIFIC APPLICATIONS

- **Rotor bar condition assessment** in induction motors
- **Stator winding fault detection** in large industrial motors
- **Mechanical load anomaly detection** in motor-driven equipment
- **Energy efficiency monitoring** and optimization of motor systems

BENEFITS

- **Early detection of motor faults**, potentially reducing repair costs by up to 60%
- **Improved energy efficiency** through identification of underperforming motors
- **Enhanced production reliability** by preventing unexpected motor failures
- **Optimized motor maintenance schedules** based on actual motor condition

By leveraging these advanced monitoring techniques, **DGC AFRICA and EAMS** provide a comprehensive solution for asset health management. Our integrated approach ensures that all aspects of your critical equipment are continuously monitored, allowing for truly predictive maintenance and optimized operations.



**MONITORING
THE HEALTH
OF ELECTRIC
MOTORS
& IDENTIFYING
POTENTIAL
ISSUES EARLY**



THE BENEFITS OF IMPLEMENTING ONLINE CONDITION MONITORING WITH DGC AFRICA & EAMS

REDUCED DOWNTIME

Predict and prevent equipment failures before they occur, minimizing unplanned downtime and associated costs. **Studies show that predictive maintenance can reduce downtime by up to 45% and extend machine life by 20-40%.**

EXAMPLE: *By deploying our online vibration solution, the Asset Monitoring Centre of a major Zink producer was able to identify and assess high vibration levels on the output side of their raw ore mill. This enabled the maintenance team to plan the replacement of the output pinion, bearings, and seals while continuously monitoring the bearing condition. After the planned replacement of these parts, the vibration levels returned to normal. The predictive maintenance solution enabled the mine to prevent a catastrophic failure that would have required it to, not only replace the actual gearing, bearings and casing of the mill, but also rectify damage to secondary components such as the electric motor and pinion. This resulted in a saving of USD 134,600 and 18 days of lost production.*

OPTIMIZED MAINTENANCE

Move from time-based to condition-based maintenance, reducing unnecessary interventions and focusing resources where they're needed most. **Organizations implementing condition-based maintenance typically see a 25-30% reduction in maintenance costs and a 70-75% decrease in breakdowns.**

EXAMPLE: *After the installation of a site wide online vibration monitoring solution (both mine and process plant), the predictive inspection team of a senior iron ore miner were able to avoid a loss of 23 million tons in iron ore production. In addition, they were able to eliminate more than 6,500 hours of equipment downtime for corrective maintenance as a result of their predictive monitoring program which included the replacement of 756 defective bearings, whilst avoiding actual equipment failures. In addition to optimized maintenance, remote monitoring also significantly reduced the risk exposure of the condition monitoring team.*

EXTENDED ASSET LIFE

Identify and address issues early, prolonging the operational life of your valuable assets and deferring costly replacements. **Proper condition monitoring and predictive maintenance can extend asset lifetime by 20-40%, significantly delaying capital expenditure on replacements.**

EXAMPLE: *Using our electrical motor condition monitoring (MCM) solution, a cement plant detected a problem with their 2350 kW, medium voltage (6600 V) vertical mill drive motor. Typically, the operation operating profile for this type of application exhibits inherent and very high load variations, making it difficult to accurately analyse motor condition, using traditional MSA techniques. With the MCM solution it was however possible to separate the 0-11Hz frequency components associated with the normal operation of a vertical mill, from instantaneous power fluctuations that presented itself in the 1Hz reactive power spectrum, indicating an abnormal rotor insulation condition. Upon inspection of the rotor, and the mechanical brush mechanisms in particular, it was found that these were covered with cement particles/dust. Together with the high environmental humidity levels, the dust contamination was creating abnormal paths for leakage currents circulation, which is a typical sign of degraded insulation or contamination. After cleaning of and reassembly of the motor, the motor condition readings returned to normal. By identifying the root cause of the failure mode and introduction of improved preventive component cleaning tasks, the plant not only prevented an eventual catastrophic failure and replacement of this motor at a cost of \$330 000-400 000, but also extended the economic operating life thereof.*

IMPROVED SAFETY

Reduce the risk of catastrophic failures that could endanger personnel or the environment, creating a safer workplace. **Companies with mature predictive maintenance programs have reported up to 70-75% fewer safety and environmental incidents related to equipment failures.**

EXAMPLE: As part of its online condition monitoring program, a senior iron miner installed our online wireless vibration monitoring solution with its unique “operation-based” data gathering functionality on its heavy mining vehicles such as drilling rigs, excavators and dump trucks. The benefits for the program were two-fold, as the online solution significantly reduced both the level of effort to obtain reliable vibration data, as well as the exposure risk of the monitoring team. Benefits reported by the miner’s maintenance team included \$5 million savings on machine maintenance and downtime, 45h of avoided to risk exposure to the inspection team, as well as the avoidance of 300 h in equipment downtime.

ENHANCED ENERGY EFFICIENCY

Optimize equipment performance, leading to reduced energy consumption and lower operational costs. **On average, condition monitoring and subsequent optimization can lead to energy savings of 5-15% in industrial settings.**

EXAMPLE: Using our electrical motor condition monitoring (MCM) solution, a cement plant identified sporadic power quality problems with the power supply to its 2500 kW medium voltage (6600 V) mill drive motor. Under normal plant conditions this motor operates with very high load variations (i.e. from no-load to rated current in less 0.25 seconds), rendering traditional motor signature analysis (MSA) diagnostic techniques ineffective. Using the advanced instantaneous power analysis capability of the MCM solution, it was however possible to trace the problem to the 6.6 kV feed bus that was common to two 12-pulse variable speed drives. These VSDs introduced harmonic distortion in the bus which negatively impacted the kiln drive motor. Using the detailed harmonic analysis provided by the MSM solution, the customer was able to specify the installation of a power filter to improve the power quality to the mill drive motor.

DATA-DRIVEN DECISION MAKING

Leverage real-time insights for informed decisions on asset management, maintenance planning, and capital investments. **Organizations leveraging advanced analytics for maintenance decision-making report up to 30% improvement in asset availability and a 50% reduction in maintenance planning time.**

EXAMPLE: A large open-pit copper mining operation operating 60 dump trucks, 10 excavators, and 15 auxiliary units used our online oil monitoring solution to transmit real-time oil condition data on the dump truck engine, gearbox and hydraulic oil systems. With dump truck downtime costing up to \$100p per hour, this enabled the miner to optimise their dump truck maintenance by adapting predictive maintenance principles and increasing the service intervals from 500hrs to 678 hours, while extending oil life and identifying early onset of wear or contamination related defects. This resulted in a 26% reduction in maintenance costs and oil consumption.

Changing to a condition-based maintenance schedule using Tan Delta has enabled the service interval to be, resulting in a. The operator experiences fewer unexpected breakdowns as the Tan Delta system will detect any equipment anomalies or contamination before damage, enabling preventative maintenance.

By partnering with DGC AFRICA and EAMS for Online Condition Monitoring, you’re not just implementing a technology solution – you’re transforming your entire approach to asset management. Our clients consistently report significant improvements in operational efficiency, cost savings, and overall equipment effectiveness. Let us help you unlock the full potential of your assets and drive your business towards a more profitable and sustainable future.

ELEVATE YOUR ASSET MANAGEMENT STRATEGY

CONTACT US TODAY TO SCHEDULE A DEMONSTRATION OF OUR ONLINE CONDITION MONITORING SOLUTIONS.

Our experts are ready to develop a tailored monitoring strategy that will optimize your operations, enhance safety, and drive long-term efficiency.



TRANSFORM YOUR ASSET PERFORMANCE

– LET'S BUILD A MORE EFFICIENT &
SUSTAINABLE FUTURE TOGETHER

THE NEXT STEP

Through our Online Condition Monitoring Solutions, **DGC AFRICA and EAMS** ensure the continuous optimization of your assets while fostering a culture of innovation and environmental stewardship. Join us to set the industry standard, enhance productivity, and promote sustainability across various industrial sectors. Partnering with **DGC AFRICA and EAMS** means investing in the future of your operations, where real-time insights, enhanced operational efficiency, and reliable performance are guaranteed.



THE POWER OF PARTNERSHIP

By choosing **DGC AFRICA** and **EAMS** for your Asset Integrity Management needs, you're not just getting a service provider – you're gaining a powerful ally in your quest for operational excellence.

Our partnership brings together:

DGC AFRICA's extensive experience and deep understanding of African industrial contexts.

EAMS's cutting-edge asset management software and global best practices.

A comprehensive suite of services that cover every aspect of asset integrity management.

A team of experts committed to driving innovation and delivering tangible results.

EXPERIENCE THE SYNERGY OF LOCAL EXPERTISE AND GLOBAL INNOVATION

Let **DGC AFRICA** and **EAMS** transform your asset management practices and propel your business towards a more efficient, safe, and sustainable future.





DGC INTERNATIONAL

E International@dgc-africa.com

2nd Floor, The AXIS,
26 Bank Street,
Cybercity,
Ebene, 72201,
Mauritius

DGC SOUTH AFRICA

Contact Person: Wynand Boshoff

T +27 16 421 3720
E sales@dgrpint.com

10 Smuts Avenue, Vereeniging,
1930, South Africa

REGIONAL OPERATIONS

DGC NORTH-WEST

Contact Person: Gawie Hugo
T +27 83 391 0531
E Northwest@dgc-africa.com

DGC KWA-ZULU NATAL

Contact Person: Denver Gounden
T +27 73 161 9913
E Kzn@dgc-africa.com

DGC LIMPOPO

Contact Person: Walter Mulovhedzi
T +27 76 896 7676
E Limpopo@dgc-africa.com

DGC ZAMBIA

Contact Person: Warren du Plessis

T +260 761 83 2470
T +27 82 319 8005
E Zambia@dgc-africa.com

Plot 2394, Freedom Way,
Mufulira

DGC DEMOCRATIC REPUBLIC OF CONGO

Contact Person: Warren du Plessis

T +243 8996 49 493
T +27 82 319 8005
E DRC@dgc-africa.com

Kolwezi Office:

118 Avenue Kalima, Quartier Mutoshi,
Commune Manika / Kolwezi

Lubumbashi Office:

199 Avenue Mubanzo Quartier; Golf Malela.
Commune Lubumbashi,
Province du Haut-Katanga, République
démocratique du Congo

DGC MADAGASCAR

Contact Person: Abizar Pichori

T +261 32 112 2122
E Madagascar@dgc-africa.com

Lot Ivx 30 Bis Ankazomanga rue
Dr Raseta Antananarivo, 101,
Madagascar

DGC ZIMBABWE

Contact Person: Douglas Mhazo

T +263 772 514 480
E Zimbabwe@dgc-africa.com

311 Esap Way, Willowvale
Harare, Zimbabwe

OUR OFFICES



www.dgc-africa.com