

PRECISION ENGINEERING

INDUSTRIAL CONSULTATION

CEMENT . MINING . FERTILIZERS



GENERAL CATALOGUE ▼





MICROTECHNIK

DISCOVER YOUR POTENTIALS

CEMENT . MINING . FERTILIZERS

MEASURE PERFORMANCE

DESIGN NEW SYSTEMS

SIMULATE REALITY

MODIFY EXIST DESIGNS

ANALYZE FAILURE

SUPERVISE EXECUTIONS

INNOVATE SOLUTIONS

MANAGE PROJECTS



“

As heavy industries like cement, mining, and fertilizers rapidly evolve to meet global demand, the reliability of equipment performance becomes paramount.

MICROTECHNIK CONSULTING FZE is dedicated to ensuring this reliability through advanced engineering solutions.

Our expertise lies in providing precise measurements, sophisticated analyses, and expert consulting services. We leverage cutting-edge software to conduct 3D modeling and simulations, optimizing project timelines and costs. By delivering comprehensive studies, modifications, and tailored maintenance strategies, we empower our clients to achieve operational excellence and maximize equipment lifespan.

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GEAR SERVICE

NO OFF EQUIPMENT

18

GEAR UNIT



- Type: Planetary gearboxes
- Max unit power_KW: 8000
- Types of served units:
 - KMPP_Flender
 - HCPP_Flender
 - CPU_Maag
 - WPU, WPV_Maag
 - MLXSQ_NGC
 - JQLX_Chogqing

NO OFF EQUIPMENT

07

GEAR UNIT



- Type: Parallel shaft gearboxes
- Max unit power_KW: 7000
- Types of served units:
 - H2SH_Flender
 - H3SH_Flender
 - MDSS_Flender
 - M3RSF_SEW

NO OFF EQUIPMENT

15

GEAR UNIT



- Type: Side drive gearboxes
- Max unit power_KW: 7300
- Types of served units:
 - H2SH_Flender
 - H3SH_Flender
 - MDSS_Flender
 - M3RSF_SEW

Precision Gear Solutions

We specialize in comprehensive gear services, including refurbishment, rebuilding, overhauling, maintenance, installation, inspection, testing, and condition monitoring. Our innovative engineering approach, backed by cutting-edge technology and skilled experts, delivers optimal solutions for a wide range of gear units.

Details of services

- ✓ Gearbox overhauling & refurbishing
- ✓ Gearbox meshing/ timing analysis and adjustment
- ✓ Gearbox selection, design & engineering studies
- ✓ Gearbox inspection, condition evaluation
- ✓ Gearbox vibration analysis, thermography imaging, endoscopy imaging
- ✓ Backlash measurements & adjustment
- ✓ Bearing condition analysis
- ✓ Bearing endplay measurements & adjustment
- ✓ Gears mounting distances measurements & adjustment
- ✓ Gearbox installation, commissioning & test run
- ✓ Gearbox casing measurements
- ✓ Gears engineering, modelling & 3D laser scanning
- ✓ Geometrical dimensioning & tolerances "GD&T"
- ✓ Gearbox modification studies

OPEN GEAR SERVICE

Precision Girth Gear Services

With years of experience in the industry, we provide tailored solutions for a wide variety of girth gear needs. Our advanced diagnostic tools and dynamic measurement systems enable us to accurately assess the condition of your girth gear, even under full load. This ensures optimal performance and longevity.

Details of services

- ✓ Girth gear refurbishing, reprofiling
- ✓ Girth gear meshing analysis and adjustment
- ✓ Girth gear selection, design & engineering studies
- ✓ Girth gear inspection, condition evaluation
- ✓ Girth gear vibration analysis, thermography, endoscopy imaging
- ✓ Backlash measurements & adjustment
- ✓ Journal bearing condition analysis
- ✓ Girth gear mounting centre distances measurements & adjustment
- ✓ Girth gear installation, commissioning & test run
- ✓ Girth gear mounting flange measurements
- ✓ Girth gear engineering, modelling & 3D laser scanning
- ✓ Geometrical dimensioning & tolerances "GD&T"
- ✓ Girth gear modification studies
- ✓ Girth gear runout and dynamics measurements

NO OFF EQUIPMENT

17

GIRTHGEAR



- Type: Girth gear with single pinion, double pinion drive or side drive
- Unit power_KW: 7300
- Types of served units:
 - FC
 - CMD
 - Maag
 - Humboldt KHD
 - Polysius
 - Sinoma

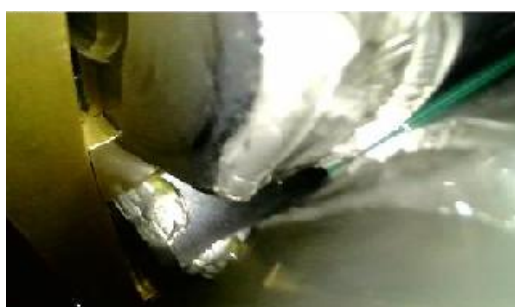
CONDITION MONITORING



DISPLACEMENT MEASUREMENTS



THERMOGRAPHY IMAGING OF GEARBOX



ENDOSCOPY IMAGING OF BEARING INTERNALS

Expert condition monitoring

Our certified specialists utilize advanced techniques, including vibration analysis, thermography, endoscopy, and lubrication analysis, to accurately identify and diagnose machine faults. By tracking trends and utilizing predictive maintenance strategies, we help prevent costly breakdowns and optimize equipment performance.

Details of services

- ✓ Vibration measurements and analysis
- ✓ Cross phase analysis
- ✓ Dynamic balancing and corrections
- ✓ Displacement measurements and analysis
- ✓ Thermography imaging and analysis
- ✓ Endoscopy imaging and analysis
- ✓ Oil sampling for analysis



TECHNICAL TRAINING

Customized training Solutions

We To elevate our technical expertise and ensure optimal performance, we offer a comprehensive training program covering a wide range of specialized topics, including, "Inspection Techniques, adjustment and Maintenance Procedures, Measurement and Metrology, Advanced Analysis Methods, Gear Design and Manufacturing". Through a combination of onsite and class-room training, our subject matter experts will enhance their knowledge and skills, empowering them to make informed decisions at all levels of technical complexity. This strategic investment in our workforce will drive sustainable improvement and position our company as a leader in technical excellence.

Examples of services "customize yours"

- ✓ Reliability centred maintenance "RCM"
- ✓ Vibration measurements and analysis level I
- ✓ Vibration measurements and analysis level II
- ✓ Thermography imaging and analysis
- ✓ Machinery lubrication
- ✓ Bearing technologies "anti-friction, journal"
- ✓ Shaft alignment "conventional, advanced "laser""
- ✓ Engineering measurements
- ✓ Gears technologies "gears, gearboxes, open gears"
- ✓ Root cause failure analysis
- ✓ 3D laser scanning & reverse engineering
- ✓ Ball mills' technologies and maintenance
- ✓ Rotary kiln troubleshooting
- ✓ Vertical mills' technologies and maintenance
- ✓ Hydraulic systems
- ✓ Pneumatic systems
- ✓ Cement process measurements
- ✓ Pyro process in cement industry
- ✓ Preventive maintenance
- ✓ Refractories in cement industry
- ✓ Kiln operation "theories and applications"
- ✓ Pumps and compressors technologies and maintenance



FLATNESS & LEVELLING MEASUREMENT



MILL LEVELLING TEST



SIDE DRIVE GEARBOX FLATNESS



CENTRAL DRIVE FLATNESS TEST

Mastering precision in flatness & levelling measures

We specialize in advanced flatness measurements and machinery leveling. Our meticulous techniques guarantee:

optimal machine performance; preventing premature failures and maximizing efficiency, preserved bearing integrity; protecting critical components from excessive wear and tear, enhanced operational reliability; Ensuring consistent and dependable equipment function.

Details of services

- ✓ Flatness measurements of gearboxes base frame
- ✓ Flatness measurements of motors base frame
- ✓ Level adjustment of gearboxes base frame
- ✓ Level adjustment of motors base frame
- ✓ Flatness measurements of ball mills slide shoe bearing
- ✓ Flatness measurements of vertical mills pedestals
- ✓ Straightness measurements and adjustment of large scale machinery
- ✓ Measurement and adjustment engineering of correct levelling at heavy machines

LASER ALIGNMENT PROTOCOLS

Precision Alignment, Any Dimension, Any Orientation

Our advanced shaft alignment technology accommodates a wide range of machinery, from small pumps to massive industrial fans. Whether horizontal, vertical, or inclined, we ensure optimal alignment for maximum performance and reliability.

Details of services

- ✓ Soft foot detection of machines
- ✓ Thermal growth calculations
- ✓ Pre-alignment and adjustment
- ✓ Laser alignment measurement
- ✓ Laser alignment correction
- ✓ Coupling runout measurement

NO OFF EQUIPMENT

08

TORSION SHAFT



- Category name: Torsion shaft
- Max transmitted power "KW": 7000
- Types of served units:
 - Flender
 - Maag
 - TCDRT, Sinoma



TORSION SHAFT LASER ALIGNMENT



FLEXIBLE COUPLING LASER ALIGNMENT

TECHNICAL AUDIT SERVICE

NO OFF EQUIPMENT

50

BELT CONVEYORS



88%

- Category name: Conveyor
- Category code: BC
- Total length, meter: 9,876
- Defected length, meter: 1,185
- Defected locations: ⚠

121.BC100, 121.BC200, 123.BC200, 131.BC100, 131.ST200,
131.BC400, 131.BC500, 212.BC200, 212.BC460, 241.BC130,
311.BC600, 311.BC620, 321.BC200, 321.BC270, 321.BC010,
481.BC150, 481.BC160, 471.BC170, 481.BC580, 481.BC600,
511.BC800, 511.BC850, 531.BC010, 531.BC200, 531.BC210,
531.BC270,

- Condition of health, %: 88



DOMINANT FAILURE MODE(S)

- Belt cuts, patches, surface damages



DOMINANT FAILURE MODES

FAN_TAG	FM*	FAN_TAG	FM*
321.FN400	M B F	441.FN300	V
331.FN400	V	441.FN305	😊
331.FN110	😊	441.FN310	C
421.FN433	😊	441.FN315	😊
431.FN560	😊	441.FN320	😊
431.FN570	😊	441.FN325	M B
441.FN590	M	441.FN330	😊
451.FN240	😊	441.FN335	V
531.FN560	F	441.FN340	M F
461.FN400	😊	441.FN345	V

FM*
FAILURE
MODES
LEGEND



Complete fan OK

Motor fault
M BRG faultImpeller
faultFan bearing
faultCasing
faultVibration fault
Balance fault

Maximize Your Equipment's Performance

Our comprehensive technical audits cover a wide range of aspects, including : mechanical, process, condition based, measurements, FAT, etc. Tailored to your specific needs, our audits identify opportunities for improvement and help you achieve optimal efficiency.

Details of services

- ✓ Mechanical audits
- ✓ Ball mill audit
- ✓ Vertical mill audit
- ✓ Rotary kiln audit
- ✓ Pyro process audit for cement plant
- ✓ Mass and gas balance audit
- ✓ Plant performance and reliability audit
- ✓ Gearbox health audit
- ✓ Clinker cooler losses audit
- ✓ Fans performance audit
- ✓ Conveying systems audit



3D LASER SCANNING & REVERSE ENGINEERING

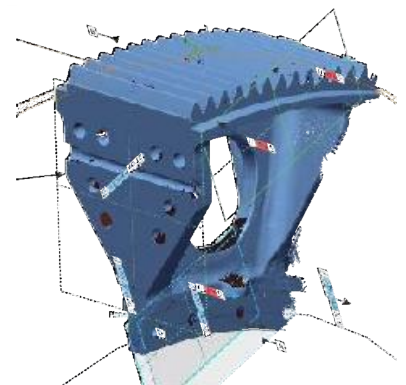
Unleash the Power of 3D Scanning

Our state-of-the-art 3D scanning solutions deliver:

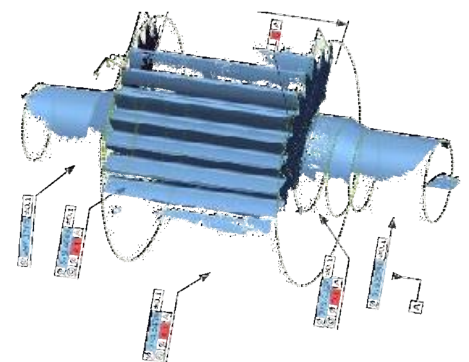
- Accurate dimensional measurements
- Detailed reverse engineering
- Virtual and augmented reality applications
- Precise fabrication drawings
- Efficient equipment repair and maintenance
- Proactive wear monitoring

Details of services

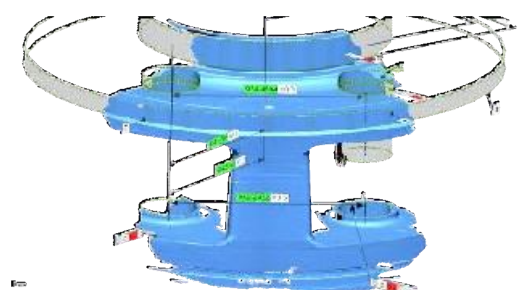
- ✓ 3D laser scanning for any object with any size
- ✓ Gears profile scanning
- ✓ Casing profile 3D laser scanning
- ✓ Bearing bores concentricity and center distance tests
- ✓ Kilns' and mills' tyres cylindricity test
- ✓ Large diameter measurements
- ✓ Wear parts, segments,
- ✓ Geometrical dimensioning & tolerances "GD&T"
- ✓ Gearbox modification studies
- ✓ Surfaces perpendicularity and angularity test
- ✓ Large objects runout measurements at static condition
- ✓ Reverse engineering of different parts
- ✓ Parts engineering for repair, refurbishment, and fabrication



GEARS PROFILE 3D SCAN



STATIC RUNOUT TEST



CONCENTRICITY TEST

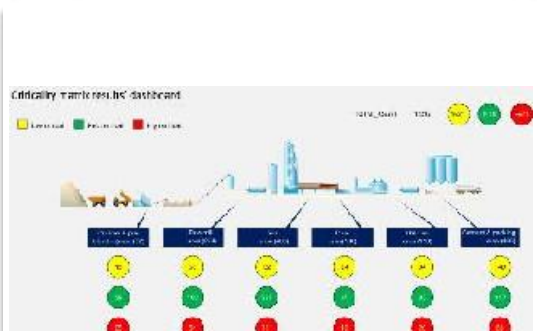
MAINTENANCE STRATEGY & RELIABILITY DRIVEN SYSTEM



MACHINE HEALTH DASHBOARD



FAILURE TRACKING SHEET



ADVANCED REPORTING

Optimize Your Assets, Maximize Your Results

Our maintenance strategy and reliability-driven solutions help you achieve:

- Reduced Operational Costs
- Increased Production Uptime
- Improved Asset Performance

Details of services

- ✓ Gearbox overhauling & refurbishing
- ✓ Gearbox meshing/ timing analysis and adjustment
- ✓ Gearbox selection, design & engineering studies
- ✓ Gearbox inspection, condition evaluation
- ✓ Gearbox vibration analysis, thermography imaging, endoscopy imaging
- ✓ Backlash measurements & adjustment
- ✓ Bearing condition analysis
- ✓ Bearing endplay measurements & adjustment
- ✓ Gears mounting distances measurements & adjustment
- ✓ Gearbox installation, commissioning & test run
- ✓ Gearbox casing measurements
- ✓ Gears engineering, modelling & 3D laser scanning
- ✓ Geometrical dimensioning & tolerances "GD&T"
- ✓ Gearbox modification studies



PROJECTS' SUPERVISION

Your Project, Our Expertise

From concept to commissioning, our dedicated team delivers exceptional project supervision services. We guide your project to success, ensuring timely completion and optimal performance.

Details of services

- ✓ Machinery overhauling & refurbishing "Gearboxes, mills, kilns, crushers, conveying systems...etc
- ✓ Replacement of equipment with new or repaired
- ✓ Modification studies engineering to installation
- ✓ Installation of heavy equipment
- ✓ Replacement or reversing of girth gears and pinions
- ✓ Adaptation of new or modified equipment
- ✓ Engineering studies in mill charge design and its effect
- ✓ Fabrication of parts, objects and machinery
- ✓ FAT test and inspection reports of parts and machinery
- ✓ Commissioning and test run of machinery
- ✓ Modification and repair execution
- ✓ Concrete foundation and grouting activities



PLANETARY GEARBOX REFURBISHMENT

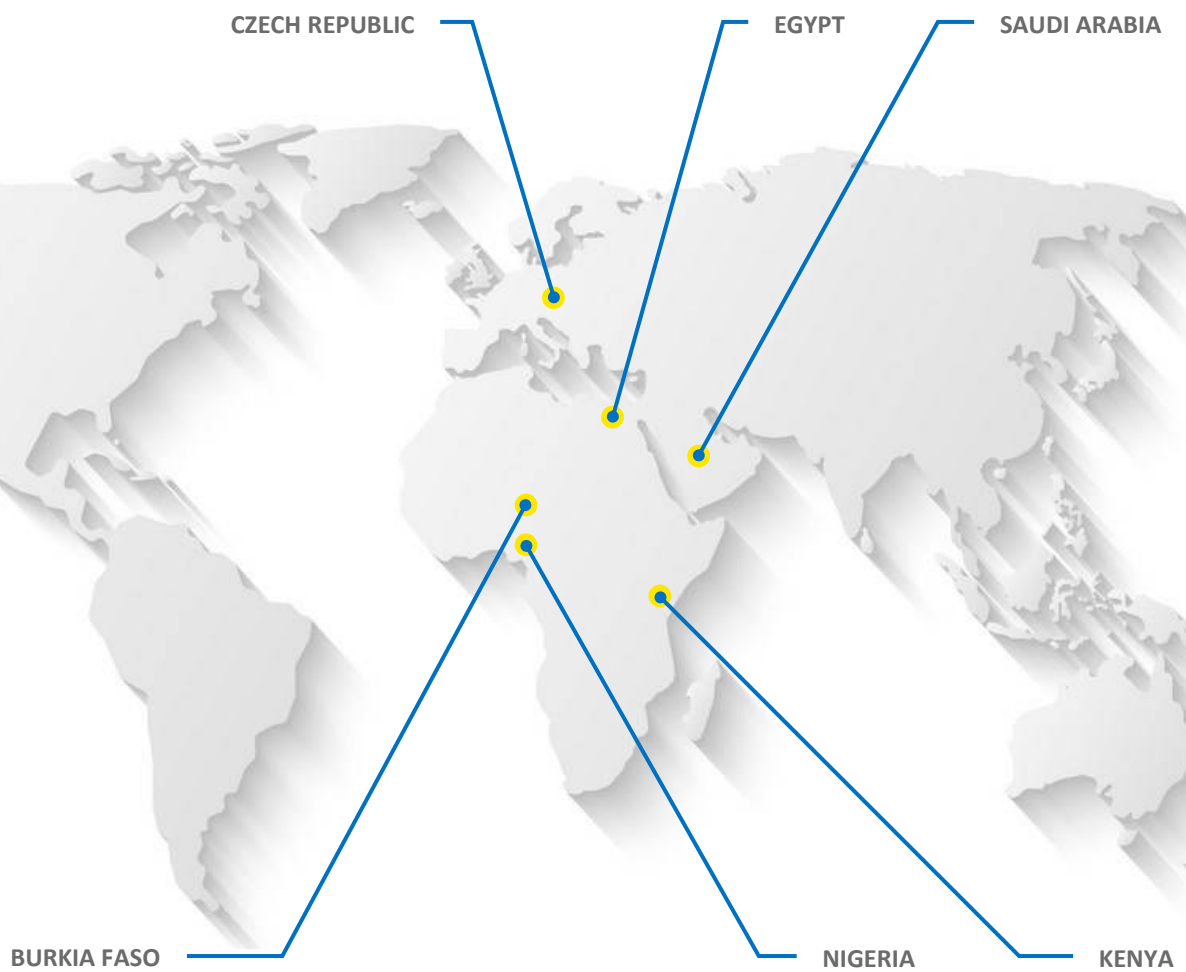


JOURNAL BEARING SCRAPPING



SAG MILL GEARBOX ASSEMBLY

OUR SPECIALISTS' FOOT PRINT





CZECH REPUBLIC



WIKOV

SAUDI ARABIA



Darkstone

EGYPT



KENYA



BURKINA FASO



NIGERIA





TECHNICAL COLLABORATION PARTNERS

Your Partner for Comprehensive Solutions

Leveraging our strong industry partnerships, we offer:

- Customized Solutions: Tailored to your specific requirements.
- Rapid Deployment: Efficient project execution and implementation.
- Reliable Support: Ongoing maintenance and technical assistance.



Together we are providing comprehensive anti-wear protection material and tailored castable refractory solution for cement, mining and different industries.



Together we are providing comprehensive gear design, engineering, reverse engineering, fabrication and complete refurbishment of gear units with different sizes include customized fabricated spare parts and gears of diverse types.



SCAN WITH YOUR MOBILE OR TABLET THE QR CODE FOR QUICK ACCESS



WEBSITE



CONTACT WHATSAPP



EMERGENCY CALL



CATALOGUE



CONSULT EXPERT



LINKEDIN PAGE



QUICK EMAIL

CASE STUDY

INNOVATION SUSTAINABILITY OF MACHINE INSTALTLATION & REFURBISHMENT

CHALLENGE

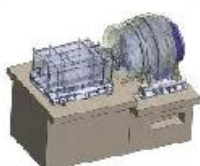
TYPE OF CHALLENGE	Severe gears and bearing breakage at 2nd stage
POWER/ CAPACITY OF EQUIPMENT (KW)	6100 / 3000 TPD
FIGURE OF LOSSES AT CLEINT FACILITY	50% of total plant cement production
DEGREE OF COMPLEXITY	Central drive gearbox + offset input 3-stages (2-planetary+1-Helical)
AVAILABLE ALTERNATIVE	30% less in power rating + 40 year service/ scrap
TYPICAL SOLUTION DURATION (DAYS)	420

LOCATION

SAUDI ARABIA



METHODOLOGY TO SUCCESS

SELECTION OF
ALTERNATIVESDESIGN &
ENGINEERINGREFURBISHMENT
PROCESSFABRICATIONS OF
MODIFICATIONSINSTALLATION OF
INNOVATIONMONITORING OF
PERFORMANCE

ACHIEVEMENTS

EQUIPMENT SERVICE RESTORATION	Successful
WORKING CONDITION AFTER UPGRADE	Stable
SETUP OF PROTECTIONS/ INSTRUMENTS	Successful
DURATION OF ACCOMPLISHMENT (DAYS)	85
COST OF SOLUTION (% OF TYPICAL)	45%

DIRECT ADDED VALUE

RESTORED DURATION OF PRODUCTION (DAYS)	335
RESTORED AMOUNT OF PRODUCTION (APPROX TONS)	600,000
MAINTAINABILITY OF EQUIPMENT	Multiple
ADDITIONAL ADVANTAGES OF UPGRADE	
The upgrade is (3 in 1) can successfully adapt installation of 3 different types/ sizes of gearboxes + 2 positions of installations without any further modifications.	

CASE STUDY

INNOVATIVE WEAR AND TIME SYNCHRONIZE RESTORATION OF MILL SIDE DRIVE

CHALLENGE

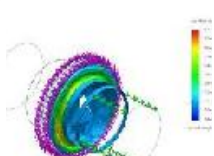
TYPE OF CHALLENGE	Extreme vibrations due to severe internals wear
POWER/ CAPACITY OF EQUIPMENT (KW)	3454 / 1800 TPD
FIGURE OF LOSSES AT CLIENT FACILITY	50% of total plant cement production
DEGREE OF COMPLEXITY	Side drive gearbox + double output pinions 3-stages + 4-shafts + timing synchronize
AVAILABLE ALTERNATIVE	Not available
TYPICAL SOLUTION DURATION (DAYS)	360

LOCATION

EGYPT



METHODOLOGY TO SUCCESS

INSPECTION OF
CONDITIONDESIGN &
ENGINEERINGREFURBISHMENT
PROCESSFABRICATIONS OF
MODIFICATIONSINSTALLATION OF
INNOVATIONMONITORING OF
PERFORMANCE

ACHIEVEMENTS

EQUIPMENT SERVICE RESTORATION	Successful
WORKING CONDITION AFTER UPGRADE	Stable
SETUP OF PROTECTIONS/ INSTRUMENTS	Successful
DURATION OF ACCOMPLISHMENT (DAYS)	65
COST OF SOLUTION (% OF TYPICAL)	33%

DIRECT ADDED VALUE

RESTORED DURATION OF PRODUCTION (DAYS)	295
RESTORED AMOUNT OF PRODUCTION (APPROX TONS)	300,000
MAINTAINABILITY OF EQUIPMENT	Multiple

ADDITIONAL ADVANTAGES OF UPGRADE

The upgrade successfully restored worn internals of gear teeth with replaceable consumables modifications to enable adjustment of timing synchronize of double pinion drives.



CHALLENGE

TYPE OF CHALLENGE	Engineering & design of new girth gear + 2-pinions
POWER OF EQUIPMENT (KW)	2 X 2350
FIGURE OF LOSSES AT CLEINT FACILITY	20% of total plant cement production
DEGREE OF COMPLEXITY	Modified girth gear + double pinion drive (defected + vibrations) gear fixation arrangements
AVAILABLE ALTERNATIVE	New modified GG + 2 new pinions
DESIGN MODIFICATIONS/ SIMULATION	New gears' pedestals + new fixation arrangements

LOCATION

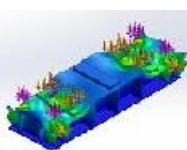
EGYPT



METHODOLOGY TO SUCCESS



MEASUREMENTS
OF PARTS



FEA
STUDY



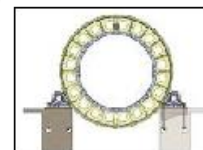
3D LASER
SCANNING



3D LASER SCAN
PRODUCT FILES



GD&T
STUDY



FABRICATION
DRAWINGS

ACHIEVEMENTS

EQUIPMENT SERVICE COMPLETION	Successful
DETAILED DESIGN & ENGINEERING STUDIES	Accomplish
DETAILED FABRICATION DRAWINGS	Accomplish
DURATION OF ACCOMPLISHMENT (DAYS)	24
COST OF SERVICE (% OF TYPICAL)	▼ 60%

DIRECT ADDED VALUE

RESTORED DURATION OF SERVICE (DAYS)	▲ 150%
UPGRADE IMPROVE PERCENT (%) OF FAULTS	100%
MAINTAINABILITY OF EQUIPMENT	Multiple

ADDITIONAL ADVANTAGES OF UPGRADE

The upgrade design will eliminates the major faults of operation and installation also will improve machine breakdown rates due to existing faulty design arrange-



CASE STUDY

COMPREHENSIVE REFURBISHMENT & TOOLING OF SAG MILL GEARBOX

CHALLENGE

TYPE OF CHALLENGE	Refurbishment of SAG mill gearbox
POWER OF EQUIPMENT (KW)	7000
FIGURE OF LOSSES AT CLEINT FACILITY	No losses - proactive replacement
DEGREE OF COMPLEXITY	Parallel shaft gearbox + offset input 2-stage (2-Helical shafts)
AVAILABLE ALTERNATIVE	Standby gearbox under refurbishment
TYPICAL SERVICE DURATION (DAYS)	14

LOCATION

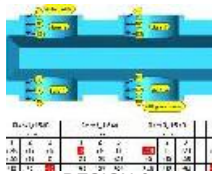
EGYPT



METHODOLOGY TO SUCCESS



INSPECTION OF
CONDITION



DESIGN &
ENGINEERING



REFURBISHMENT
PROCESS



FABRICATIONS OF
MODIFICATIONS



INSTALLATION OF
INNOVATION



MONITORING OF
PERFORMANCE

ACHIEVEMENTS

EQUIPMENT SERVICE RESTORATION	Successful
CONDITION AFTER REFURBUSHMENT	Normal
SETUP OF PROTECTIONS/ INSTRUMENTS	At site
DURATION OF ACCOMPLISHMENT (DAYS)	10
COST OF SERVICE (% OF TYPICAL)	▼ 60%

DIRECT ADDED VALUE

RESTORED DURATION OF SERVICE (%)	▲ 40%
RESTORED EQUIPMENT HEALTH (%)	100%
MAINTAINABILITY OF EQUIPMENT	Multiple

ADDITIONAL ADVANTAGES OF REFURBISHMENT

Onsite gear training had been accomplished for subject matter experts, gearbox prepared for transmit power in reverse direction of rotation, and have designed/ prepared maintenance special tools.

CASE STUDY

PRECISION ACTUAL 3D GEAR RE-ENGINEERING & POWER RATING CALCULATIONS

CHALLENGE

TYPE OF CHALLENGE

Gear drive re-engineering & ball mill audit

POWER OF EQUIPMENT (KW)

6550

FIGURE OF LOSSES AT CLEINT FACILITY

20% of plant cement production

DEGREE OF COMPLEXITY

Side drive gearbox + double output pinions
Mill power influence parameters assessment

AVAILABLE ALTERNATIVE

Not available

RE-ENGINEERING_AUDIT_STUDY

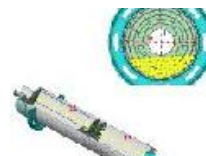
Actual gears' profiles, GG/pinion center distance,
actual wear/ GD&T condition, power calculations

LOCATION

CZECH



METHODOLOGY TO SUCCESS

THERMOGRAPHY
IMAGING3D LASER
SCANNINGGEARBOX
FLATNESS TESTDISPLACEMENT
MEASUREMENTSMILL POWER
CALCULATIONSFABRICATION
DETAILS

ACHIEVEMENTS

EQUIPMENT SERVICE COMPLETION

Successful

DETAILED ENGINEERING & AUDIT STUDIES

Accomplish

DETAILED FABRICATION DRAWINGS

Accomplish

DURATION OF ACCOMPLISHMENT (DAYS)

25

COST OF SERVICE (% OF TYPICAL)

▼ 60%

DIRECT ADDED VALUE

RESTORED DURATION OF SERVICE (DAYS)

▲ 200%

UPGRADE IMPROVE PERCENT (%) OF FAULTS

100%

MAINTAINABILITY OF EQUIPMENT

Multiple

ADDITIONAL ADVANTAGES OF UPGRADE

Onsite gear re-engineering allows data acquisition with more flexibility, non-interrupting production activities, no disassembly requirements for equipment, fast and accurate measurements, so its most exist economic solution.



CASE STUDY

INNOVATIVE DIFFERENT GEARBOXES INETRNALS MERGING REFURBISHMENT OF MILL SIDE DRIVE

CHALLENGE

TYPE OF CHALLENGE	Severe internal gears breakage at output stage
POWER/ CAPACITY OF EQUIPMENT (KW)	4550 / 3600 TPD
FIGURE OF LOSSES AT CLEINT FACILITY	50% of plant cement production
DEGREE OF COMPLEXITY	Side drive Gearbox + double output pinions 3-stages + 4-shafts + timing synchronize
AVAILABLE ALTERNATIVE	Same power rating + 10 year service/ scrap
TYPICAL SOLUTION DURATION (DAYS)	210

LOCATION

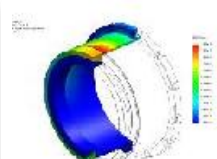
SUDAN



METHODOLOGY TO SUCCESS



INSPECTION OF PARTS



DESIGN & ENGINEERING



REFURBISHMENT PROCESS



FABRICATIONS OF MODIFICATIONS



INSTALLATION OF INNOVATION



MONITORING OF PERFORMANCE

ACHIEVEMENTS

EQUIPMENT SERVICE RESTORATION	Successful
WORKING CONDITION AFTER UPGRADE	Stable
SETUP OF PROTECTIONS/ INSTRUMENTS	Successful
DURATION OF ACCOMPLISHMENT (DAYS)	20
COST OF SOLUTION (% OF TYPICAL)	15%

DIRECT ADDED VALUE

RESTORED DURATION OF PRODUCTION (DAYS)	190
RESTORED AMOUNT OF PRODUCTION (APPROX TONS)	400,000
MAINTAINABILITY OF EQUIPMENT	Multiple

ADDITIONAL ADVANTAGES OF UPGRADE

The upgrade successfully merged parts of two different types of gearboxes to be installed together to produce one complete gearbox with smooth working condition, and full internal refurbishment resources.

CASE STUDY

COMPREHENSIVE PLANT AUDIT & QUALITY TESTING INSPECTION DURING SHUTDOWN

CHALLENGE

TYPE OF CHALLENGE	Plant shutdown activities technical audit evaluation
CAPACITY OF PLANT (KW)	1680 TPD of Kiln cement production
FIGURE OF LOSSES AT CLEINT FACILITY	45% of plant cement production
DEGREE OF COMPLEXITY	Multiple repairs @ clinker cooler, kiln, bag house, pre-heater, process fans, VRM, crushers, pre-blending
AVAILABLE ALTERNATIVE	New fabricated parts + repaired
SERVICE DETIALS	Alignment + condition monitoring + visual + process measurements + specific installation inspections

LOCATION

KENYA



METHODOLOGY TO SUCCESS

INSPECTION OF
EQUIPMENTLASER
ALIGNMENTVIBRATION
MEASUREMENTSPROCESS
MEASUREMENTSMILL
AUDITMACHINE
HEALTH ANALYSIS

ACHIEVEMENTS

EQUIPMENT SERVICE COMPLETION	Successful
DETAILED AUDIT INSPECTIONS & TESTS	Accomplish
DETAILED REPORTING & TEST RESULTS	Accomplish
DURATION OF ACCOMPLISHMENT (DAYS)	22
COST OF SERVICE (% OF TYPICAL)	▼ 55%

DIRECT ADDED VALUE

RESTORED DURATION OF SERVICE (DAYS)	▲ 150%
DETECTION (%) OF FAULTS BASED ON TESTS	90%
MAINTAINABILITY OF EQUIPMENT	Multiple
ADDITIONAL ADVANTAGES OF UPGRADE	This type of comprehensive audit and testing service delivers precision improved inspection tests that verify refurbishment conditions and machine quality after shut-down repairs, to assure machine proper performance.



CASE STUDY

INNOVATIVE REUSE OF FAULTY PLANETARY GEARS & LUB. UPGRADE BASED ON FEA/CFD SIMULATION STUDIES

CHALLENGE

TYPE OF CHALLENGE	Severe sun/planetary gears and bearing breakage
POWER OF EQUIPMENT (KW)	4500
FIGURE OF LOSSES AT CLEINT FACILITY	50% of plant cement production
DEGREE OF COMPLEXITY	Vertical drive gearbox + spacer coupling input 3-stage (1-planetary+1-Helical+1-spiral bevel)
AVAILABLE ALTERNATIVE	Not available
DETAILS OF SOLUTION	Gear service + planetary gear modification + CFD study + Lub upgrade + scrapping + installation

LOCATION

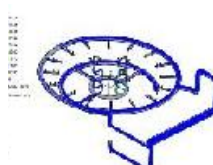
ERBIL



METHODOLOGY TO SUCCESS



INSPECTION OF
CONDITION



FEA & CFD
STUDY



REFURBISHMENT
PROCESS



FABRICATIONS OF
MODIFICATIONS



INSTALLATION OF
INNOVATION



MONITORING OF
PERFORMANCE

ACHIEVEMENTS

EQUIPMENT SERVICE RESTORATION	Successful
WORKING CONDITION AFTER UPGRADE	Stable
SETUP OF PROTECTIONS/ INSTRUMENTS	Successful
DURATION OF ACCOMPLISHMENT (DAYS)	16
COST OF SOLUTION (% OF TYPICAL)	10%

DIRECT ADDED VALUE

RESTORED DURATION OF SERVICE (DAYS) ▲ 240%

UPGRADE IMPROVE PERCENT (%) OF FAULTS 100%

MAINTAINABILITY OF EQUIPMENT Multiple

ADDITIONAL ADVANTAGES OF UPGRADE

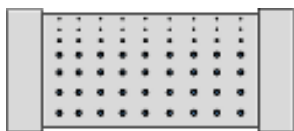
This innovative solution was successful collection of case studies of reuse of faulty planet gears to be as new gear in operation performance, refurbishment of TEF-LON journal thrust pads, and upgrade of internal lub. Pathways and lub system, using CFD simulation study.

PROVEN EXPERTISE, PIONEERING SOLUTIONS

67+

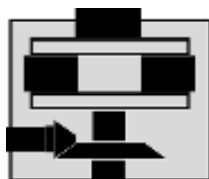
40+

15+



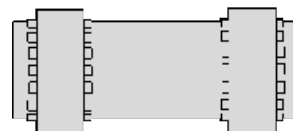
GRINDING MILLS

- Ball mills
- Vertical mills
- SAG mills



GEAR UNITS & OPEN GEARS

- Parallel shaft gears
- Planetary gears
- Side drive gears
- Pinions & girth gears



PYRO-EQUIPMENT

- Rotary kilns
- Clinker coolers



CONTACT US

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TECHNICAL SUPPORT DEPT.



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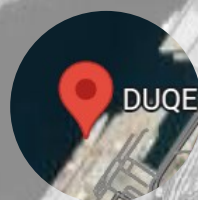


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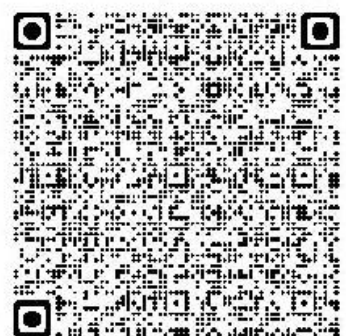
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