

Optigear 1100 Eliminates Gearbox Failures

MINING (USA)

PROCESSING PLANT WATER PUMP

Castrol Optigear® 1100 Gear Oil*

TWO-YEAR SAVINGS: \$55,160



THE SITUATION

A major phosphate mining company was changing Lufkin two-stage, double helical gearboxes on the Processing Plant water pump every year.

Due to the high temperature (190°F), a water circulation cooling system was ordered to control the temperature.

Each gearbox change lead to expenses related to the gearbox cost, cost of gear oil, gearbox replacement labor and lost production time.

Castrol was challenged to prevent failures, reduce total maintenance cost, and increase uptime.

BEFORE

- **Two gearboxes failed** in two years with parts cost - \$42,000
- Circulation cooling and water removal system cost - \$11,000
- Gear oil cost for two years - \$1,500
- Gearbox replacement labor cost in two years - \$1,760

AFTER

- **No gearbox failures** in two years.
- Gear oil cost for two years - \$1,100
- **Working temperature reduced** to 170°F, eliminating the need for the circulation cooling and water removal system.

THE SOLUTION

After through investigation of the problem root causes, Castrol engineers have concluded the following:

- Failure report provided by Lufkin has indicated scuffing and fatigue failure of the gears.
- Gearbox is located outdoors and subject to constant water contamination by rain and direct spray of the process water.
- Previously used oil from company "C" was not capable to protect gears due to the low water tolerance, and the working temperature was beyond the capabilities of this oil.
- The water and high temperature nearly tripled the speed of oil oxidation and shortened the useful oil life to 6 months.
- After 6 months in service, oil "C" was completely oxidized which caused gear wear and further increase of working temperature.
- Optigear 1100/460 gear oil was recommended to increase life of the gearbox and to extend oil change intervals.

Phosphate Processing Plant

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RECOMMENDATIONS

- Optigear 1100 Gear Oil formulated with a unique patented blend of oil soluble additives which provide very low friction, excellent EP properties and surface protection, is capable to extend gear life and to reduce working temperature by 20°F.
- Optigear 1100 Gear Oil's high water tolerance and maximum working temperature in combination with excellent oxidation resistance has quadrupled the life of the gearbox and oil change intervals.

CONCLUSION

The result after conversion to Optigear 1100 was \$55,160 savings from elimination of gearbox failures, oil usage and labor costs, with larger savings actually achieved when considering increased uptime.

Note: At the time this case study was published, gearbox was in service for 2 years trouble-free.



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OTHER POTENTIAL APPLICATIONS

- Optigear 1100 high performance gear oil is the right product for heavily and shock loaded gearboxes.
- It can be used in all mining and other gear applications with excellent integrity and long life.
- Benefits include: reduced downtime, increased parts life, less labor costs, and less waste oil.

This Lufkin two-stage helical gearbox on the Processing Plant water pump was replaced every year due to an inferior oil in use.



Water pump gearbox failures at mining processing plant, related oil & labor costs, and downtime were completely eliminated after change to Castrol Optigear 1100 gear oil.