

Dragline Gearbox Filtration Operational & Component Improvement

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Problem

Maintaining Dragline Gearbox Lubricants to low cleanliness standards presents several issues.

- Replacing the dirty fluid is costly
- The fluid is high viscosity and creates high differential pressure across standard hydraulic style filters.
- The environment inside the “house” is difficult to maintain cleanly.
- The temperature changes drastically in most mining locations.

Solution

Working with a large global mining company our personnel worked through a prototype program to design a “kidney loop” style system to achieve below specification ISO Cleanliness levels while providing filter service life that was acceptable to maintenance personnel. The system employs Pall USRT Filter media that maintains low pressure drops. While others struggled, we were able to maintain ISO codes at or below 17/15/13 with a 20” filter with service life greater than 3 months.

The system was designed with a PLC driven variable speed drive to adjust flow rates based on temperature. It was also designed as compact as possible to limit the amount of “house” floor space consumed.

Results

The company has moved fluid change outs from every 6 months to 3 years and counting. The purpose of the project was to have cleaner fluids for improvement in component health. The results of that will be ongoing but the project had a 12 month ROI with just fluid cost savings. The chart on the right displays the particle count reduction.



Particle Count Summary		
Particle Size	BEFORE Avg. # per ml	AFTER Avg. # per ml
4µm(c)	1,920,000	3,750
6µm(c)	240,000	960
14µm(c)	7,500	60



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