



Duolec® Vari-Purpose Gear Lubricant (1606)

Hydro Dam – Western Montana

D.J. Murray Gearboxes for Wicket Gates

- Implemented a reliability program for properly maintaining the gearboxes, including a better monitoring system
- Eliminated abrasive contamination caused by the previous oil
- Made changes that will contribute to a longer gear lifespan

Customer Profile

The company manages eight hydro facilities in Montana and more than 40 power generation facilities nationwide.

Application

At its Western Montana hydro dam, the company uses D.J. Murray gearboxes for its wicket gates, with a total of 22 gearboxes on the dam (see photo).

Challenge

The gearboxes were extremely contaminated and needed to be changed due to long-term neglect. Without a reliability program in place, the company had not realized the extent of the contamination. They knew they needed to implement reliability best practices to prevent contamination as well as to help the gearboxes perform reliably and last longer.

LE Solution

Jim Pezoldt, LE lubrication consultant, recommended that the company follow best practices with a focus on the lubricant and enhanced reliability. This program included the implementation of standard operating procedures such as oil filtration and annual oil sampling. Using those recommendations, the customer developed a reliability program for taking care of its gearboxes, including the best practices listed below.



Reliability Program

- The best possible flushing procedure (see below)
- The best possible lubricant for the application – LE's Duolec® Vari-Purpose Gear Lubricant (1606)
- The best possible transfer and filter system – AMS model C 10150-1-6x-18DP-120
- The best possible oil analysis program – LEAP Advanced Industrial with PQ
- Appropriate target alarms
- Onsite training
- Annual status report and review of action requirements

Lubricant Recommendation & Oil Analysis

For the few hours each year that the gearboxes run, they run under heavy loads, meaning a heavy-duty industrial gear oil is needed. Duolec 1606 is an AGMA 6 EP gear lubricant (as required) that contains a premium base oil and robust additive package, making it ideal for these gearboxes. The oil also has to stay in the gearboxes for long service intervals because it is difficult to drain and refill the oil. Duolec is designed to perform well under these conditions. And



finally, the longevity of the service time and location of the gearboxes make them susceptible to water contamination. Duolec separates readily from water to provide effective lubrication when moisture is present. Ordinary gear oils will emulsify and foam, causing increased frictional heat and poor lubrication.

The new LEAP Advanced Industrial with PQ test slate is also a good match for this application. The particle quantifier test makes it possible to determine the cleanliness of the oil and to establish the right frequency for using the filter cart.

Flushing Procedure

Step 1: Add 6% L-X® Heavy-Duty Chemical Supplement (2300) to existing oil. Run for no more than 50 hours and no less than 4 hours.

Step 2: Drain that oil while warm.

Step 3: Fill with LE's Duolec Vari-Purpose Gear Lubricant (1606).

Step 4: After 50 hours of service, open ball valve and drain the discolored oil. Do this while machine is not running (at least 20 minutes). If you find a lot of discoloration, repeat process until only clean LE oil appears.

Results

By implementing this reliability program, the customer will be able to better maintain its equipment.

Other LE Products Used

- Almaplex® Industrial Lubricant (1275) for non food grade bearings
- Monolec® R & O Compressor / Turbine Oil (6404) for turbine and governors
- Quinplex® Food Machinery Lubricant (4024) for wicket gate bearings
- Quinplex® Synthetic Food Grade Oil (4046) for waste gate hydraulic system

Thank you to Jim Pezoldt, LE lubrication consultant (pictured), for providing the information used in this report.



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