

Improved Lubrication Practices Stop Machine Failures at TEP



The TEP PdM team (from left to right): Latigo Pate, Troy Burk, Gary Gardner and Kevin Lee



The TEP lube room

Overview

Challenges

- Frequent bearing failures
- Contaminated oil
- Improper lubrication practices
- Lack of training

Solution

- Noria's Lubrication Program Development (LPD)
- Lubricant storage and handling design
- Lubrication routes and procedures
- Engineering design

Results

- Fewer machine problems
- 90-percent reduction in bearing failures
- Best practices for lubrication

The Tucson Electric Power (TEP) generating station in Springerville, Arizona, is a coal-fired plant that provides safe, reliable power to residents in the Tucson metropolitan area. With four generating units, it has a total capacity of 1,560 megawatts.

When the station began experiencing frequent bearing failures, its predictive maintenance (PdM) team analyzed the components and determined that the problems were caused by contamination and improper lubrication. The consequences of the plant's poor lubrication practices and the potential for improvement were soon brought to the attention of management.

Oil Contamination Problems

Many of the mistakes being made at the station involved lubricant storage and handling. Oil was stored in containers that were open to the atmosphere, and the oil was not filtered before being added to the equipment. This resulted in oil contaminated with coal dust.

"Totes were in the crane bay and vented to the atmosphere, so they were sucking coal dust and everything else inside them," said Latigo Pate, the station's PdM supervisor. "The oil wasn't filtered going in or out. All the different types of oil shared one pump, so you can imagine what was going into our equipment."

The exact type of oil required for most of the plant's equipment was also unknown or undocumented, so it was common for the wrong oil to be added. In addition, station personnel used any convenient container for oil top-ups, including gas cans, buckets or gallon jugs of any kind.

"It was easier to pick up a gas can, fill it with oil and then dump that in the equipment," Pate added. "Those were the types of practices that we had been doing for a long time."

A Plan of Attack

Noria was called in to identify areas at the station that needed improvement. As part of its Lubrication Program Development (LPD), Noria's team of consultants devised a plan of attack to put the plant on the path to lubrication excellence. This



DTE 25	Tan
Heavy Medium	Grey
gear 600 XP 220	Black
as Mobilgear 630	Purple
gear 600 XP 460	Dark
as Mobilgear 634	Blue
gear 600 XP 680	Light
as Mobilgear 636	Red
DTE BB	
ela Super Cylinder	
W Cylinder	
Rarus 427	

New master lube list

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– Latigo Pate, PdM Supervisor

included detailed procedures, optimized lube routes, and recommendations for proper storage and handling of lubricants to protect them from contamination.

A master lube list was established with the correct oil types for all the station’s equipment, and new color-coded top-up containers were purchased. Each oil type would now have a dedicated pump and filter. Equipment was also tagged with color-coded labels that correspond to the appropriate transfer and storage containers.

“Noria made recommendations that helped us go in the right direction,” Pate explained. “They also helped us justify to management the need for these improvements and bring to light the need for improving our lubrication because they had the credibility that management would listen to.”

The biggest change for the plant was installing new self-contained lube rooms. These climate-controlled buildings would be used to store all the station’s oil. The oil would also be filtered going into the storage totes. After the first lube room was purchased, everyone in the plant received onsite training by PdM personnel, a lubrication engineer and Noria.

“The training that Noria did was great,” Pate noted. “We had them come out and do some training for us that was very helpful. It helped operators and mechanics understand the importance of good lubrication practices.”

Avoiding Equipment Problems and Failures

Today, the plant sees far fewer equipment problems due to insufficient or improper lubrication. The station’s

lubrication-related machine failures have also been reduced dramatically. Previously, almost every call the PdM team received was the result of lubricant contamination in bearings. Pate estimates these bearing issues have decreased by at least 90 percent.

“Every now and then we still find issues, but for the most part there has been a big improvement,” Pate said.

Monthly audits now assess the plant, lube storage facility, lube buildings and transfer containers. Pictures are taken to ensure cleanliness, and reports are sent to management to show what needs to be corrected and what is going well.

The station plans to continue to enhance the filtration of its lubricants and upgrade its onsite oil analysis laboratory. Training of lab personnel and new employees will be essential as the plant moves forward with its lubrication program, which is now on the right path.

“For any recommendations or program improvements, I would go to Noria as far as the direction to take or for training,” Pate concluded. “They are the industry lubrication experts.”

For more on Noria’s Lubrication Program Development, contact us at 800-597-5460 or visit Noria.com.



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