

IKEC Deploys Lube Program to Avoid \$2 Million in Annual Losses



The renovated lube room at the IKEC generating station



IKEC senior engineering technicians Francis McGuire Jr. and William Miller

Overview

Challenges

- \$2 million in annual losses due to equipment repairs
- Continuous motor and pump failures
- Improper lubrication practices
- Poor maintenance culture

Solution

Noria's Machinery Lubrication Training

Results

- Cost savings of \$250,000 by preventing two boiler feed pump failures
- Lubricant consolidation savings of nearly \$150,000
- Increased equipment uptime and availability
- Maintenance culture change

The Indiana-Kentucky Electric Corp. (IKEC) has been providing electric service in the Ohio River Valley area for more than 60 years. Its Clifty Creek generating station in Madison, Indiana, is connected by a network of 705 circuit miles of transmission lines with a capacity of more than 1.3 million kilowatts.

A recent study on the station's motor and pump repairs revealed that approximately \$2 million dollars was being lost annually due to improper lubrication. This has led to a greater emphasis on lubrication to ensure the health and reliability of the plant's equipment.

Poor Lubrication Practices

Before 2013, overgreasing and undergreasing were common at the station, as was the use of the wrong oil and grease. No oil analysis was being performed, so oil was changed regardless of whether it was needed. Personnel also did not consider the cleanliness of the oil or the plant's oil containers as an issue. They thought "grease was grease" and "oil was oil." If a little was good, a lot was assumed to be better. As long as grease and oil were running from bearing housings or oil was dripping from the machinery, it was believed that the lubrication was sufficient.

On a typical day, operations and maintenance employees would top up or grease equipment with any lubricant they could find, using whatever container or funnel that could be located. This resulted in cross-contamination and eventually led to machine failures.

Implementing a Lube Program

When IKEC initiated its lubrication program, two technicians were sent for training by Noria Corporation. In the training, the technicians not only learned the importance of keeping lubricants clean, cool and dry, but also how far their lube program needed to go. The technicians later attended the *Reliable Plant Conference & Exhibition*, which provided more ideas for implementing a successful lubrication program. This knowledge was then passed onto other maintenance and operations personnel at the plant.

“ The training received from Noria when we first started the lubrication program and the persistence that the team shared have had the greatest impact.”

– William Miller, Senior Engineering Technician



After Noria training, IKEC technicians now control the amount of oil being ordered, which had been excessive.

When the plan for change was announced, staff initially responded slowly. Their thinking was that things had been done a certain way for 50 plus years, so why change now. There were also some questionable attitudes, doubting whether the plan would work and if the investment in time and effort would be worth it. After the goals were fully explained, the program began to advance one step at a time.

Equipment upgrades and modifications were made with the addition of desiccant breathers, sample ports, sight glasses and quick connects for offline filtering. A state-of-the-art lube room was installed complete with lubricant storage and filtration systems. A heating, ventilation and air-conditioning (HVAC) system was also added to maintain a climate-controlled temperature of a constant 72 degrees with very low humidity.

Filter carts and oil transfer containers were purchased, and proper labeling was implemented on all containers and equipment. The amount of oil being ordered, which had been excessive, was now being controlled.

A software program was used to help manage the station's equipment. At the beginning of each week, lubrication routes are automatically generated on a time basis. This involves oil sampling, asset assessments and regreasing. As more jobs are planned, oil jugs or drums are prepared for future oil changes.

The plant's reliability team has taken responsibility for all critical equipment, which includes calculating the proper amount of grease and the timing of the relubrication cycle as well as performing the regreasing.

Seeing Results

The results of the lubrication program have been gradual but consistent, as more changes are still being made. The plant's lubricant inventory has dropped from 177 drums of oil to 50. This was accomplished by working with IKEC's oil supplier and implementing a "just-in-time" procurement system. The amount of oil and grease conserved by ensuring the right amount at the right time has produced a total savings of nearly \$150,000, and this savings has been sustainable. Additionally, through oil sampling and analysis, the station

was able to prevent the failure of two boiler feed pumps, which would have cost \$250,000.

"With our oil analysis, we were able to determine the failure mode before it happened," said William Miller, a senior engineering technician at the Clifty Creek Station. "A repair was around \$15,000 for one boiler feed pump. Through oil sampling, which cost around \$35 per sample, we were able to achieve a huge savings."

The health and reliability of the station's equipment continue to improve with fewer failures and more uptime and availability. However, the biggest change has been in the buy-in of maintenance and operations personnel. Employees have been persistent in their efforts to achieve clean, cool and dry lubricants, and have taken ownership of the plant's lubricants and equipment.

"The training received from Noria when we first started the lubrication program and the persistence that the team shared have had the greatest impact," Miller noted.

Looking to the Future

Although it has been a slow process, the last four years have made quite a difference at IKEC. The plant's next project will be to install offline filtration on its turbine oil tanks. In addition, more oil sampling is being planned in an effort to attain particle counts lower than equipment manufacturer specifications. Having seen the value of lubrication training, the station also hopes to have more team members trained in the near future.

While there remains a mountain to climb to achieve lubrication excellence, IKEC appears to be on the right track in reaching its goal of making its equipment as reliable as it can be.

For more on Noria's training courses, contact us at 800-597-5460 or visit Noria.com.



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