

# 9001 PYROSHIELD® SYN GEAR LUBRICANT

COAL FIRED POWER PLANT, Pennsylvania

Foster Wheeler Ball Mills • SIC 4911 Electric Services

CUSTOMER TESTIMONIAL

**Lubricant Consumption  
Reduction of 65%**

**Pinion Gear Temperatures 20-30°  
Cooler**

**Saved \$504,000 in Pinion Gear  
Costs in 15 Years**

## CUSTOMER PROFILE

This base load power station located in Pennsylvania, is a two unit, coal fired steam plant with a generating capacity of 356 megawatts. They use northern Appalachian coal and provide power to western Pennsylvania and the PJM Power Pool. The PJM system supplies power to 13 states and the District of Columbia.

## APPLICATION

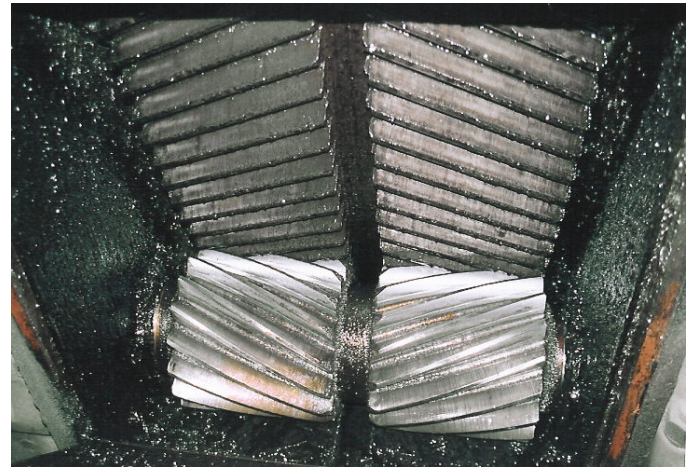
The Coal Fired Power Plant has benefited from using LE Lubricants for over fifteen years. One area of significant improvement in lubricant performance and improved equipment reliability is the open gear lubrication of their four Foster Wheeler, D8 Ball Tube Pulverizers. These ball mills pulverize coal used to fire the stations two steam boilers. The Foster Wheeler Ball Mills run continuously, processing up to 83,000 lbs. of coal per mill each hour.

## AREA OF INTEREST

Using a black asphaltic open gear lubricant the customer was contending with the following maintenance and operation issues:

### Product Consumption and Elevated Gear Surface Temperature

Farval automatic lube systems controls were set on full volume to be sprayed every 15 minutes. Pinion gear surface temperatures exceeded 180° F.



This pinion is over 10 years old, mill was running when photo was taken. Notice the excellent condition of the gear and lack of accumulated hardened product.



Used 9001  
PYROSHIELD  
is collected in  
a cake pan.

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L170649  
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### **Housekeeping**

The asphaltic product would harden to a very solid tar consistency after application. Lube delivery lines, metering blocks, valves and spray nozzles were prone to plugging resulting in poor spray patterns of lubricant requiring regular servicing of the spray system. Gears showed a build up of hardened lubricant in the gear tooth root area. Gear shrouds maintained a very thick coating of hardened product, complicating gear and scheduled mill maintenance. Waste lubricant containment was difficult, with product being directed to 3 x 4 ft. pans. These pans, containing hardened product, were emptied with great difficulty and mess.

### **Gear Life**

Pinion gears showed evidence of aggressive wear, pitting, galling with significant loss of gear tooth mass. Pinions were replaced as frequently as every two years at significant expense.

Cost of replacement of a pinion assembly is approximately \$28,000. Installation requires the labor of four millwrights, four ten hour shifts. Generating capacity is reduced during pinion replacement, revenue losses can be significant.

### ***LE SOLUTION***

Lubrication Consultant, John Hayes, recommended replacing the black asphaltic open gear lubricant with LE 9001 PYROSHIELD® Syn-Gear Lubricant, a unique, extremely heavy-duty, synthetic fluid developed specifically for ball/grinding mill applications which call for an EP lubricant to be applied using automatic spray systems. 9001 contains ALMASOL®, LE's exclusive wear reducing additive and a non-chlorinated diluent to ensure good low temperature mobility. It is translucent purple and non-staining.

### ***CUSTOMER COST SAVINGS***

Following an LE assisted conversion to 9001 PYROSHIELD® which included spray system cleaning and tuning, along with gear surface temperature monitoring, the Coal Fired Power Plant experienced the following:

#### **Product Consumption and Reduced Gear Surface Temperatures**

Spray system lube volume meters settings were reduced to 60%, with delivery frequency increased to 20 minutes. A consumption reduction of 65% or 2.22 times less lubricant. Pinion gear temperatures are 20 to 30 degrees cooler even at the lower lubricant application rates.

### **Housekeeping**

9001 PYROSHIELD® is a very heavy liquid, waste product always remains mobile, slowly drawn downward where it can easily be contained and directed to collection containers. It will not plug spray lines or nozzles, does not build up in the gear tooth root zone, or accumulate on shrouds. Clean up is minimal and complete using steam. The Coal Fired Power Plant replaced the large waste collection pan with an 8 by 11 inch. cake pan, which is emptied easily into a nearby waste oil barrel.

### **Gear Life**

The Coal Fired Power Plant realized immediate reduction in visible wear rates on all pinions. Damaged irregular tooth surfaces began to even out, indicating greatly reduced wear. In fifteen years using 9001 PYROSHIELD® the customer has replaced only two pinion assemblies, neither replacements due to lubricant failure. Conservatively, 20 pinions would have been replaced using the previous product during this time.

***Replacement Cost Using LE PYROSHEILD®***  
***2 pinions @ \$28,000 = \$56,000***

***Replacement Cost Using Black Asphaltic Gear Lubricant***  
***20 pinions @ \$28,000 = \$560,000***

***A Savings of \$504,000!***

As a service to the Coal Fired Power Plant, LE Lubrication Consultant John Hayes monitors, records and logs gear surface temperatures monthly. A log copy is updated and maintained by the maintenance dept. for reference.

### ***OTHER PRODUCTS USED***

- \* 1275 ALMAPLEX® Industrial Lubricant
- \* 4025 QUINPLEX® Food Machinery Lubricant
- \* 4622 MONOLEX® Multiplex Lubricant
- \* 4701 MONOLEC® Industrial Lubricant
- \* 1608 DUOLEC™ Vari-Purpose Gear Lubricant
- \* 6451 MONOLEC® Turbine Oil

*Lubrication Engineers would like to thank the Production Manager and the Maintenance Supervisor at the Coal Fired Power Plant and LE Lubrication Consultant John Hayes for the information provided to prepare this report.*



**John Hayes**