Account History: This is a Protein Conversion Plant. The cost of downtime is estimated at $300 per minute.

Certified Labs’ Objective: Develop a reliability partnership to reduce downtime, lower maintenance & operating expenses, and drive proactive maintenance procedures for continuous improvement.

Reduced Lubricant Consumption & Inventory

- Reduced Grease and Oil Consumption by Approximately 63%
- Reduced the quantity of hydraulic oils and gear oils by 50%

Annual Savings - Parts Repair, and Replacement

- Reduced Cooker Bearing Replacements By 88% Per Year
  By Using CCL-500 Grease: ........................................... $6,988
- Reduced Gearbox Repairs and Replacements By 63% Per Year
  By Using Certop Gear Oil: ......................................... $120,400
- Reduced 40hp Fan Bearing Failures by 75% Per Year by
  Using Premalube Grease: .......................................... $210
- Reduced Hammermill Bearing Failures by 75% Per Year
  By Using Premalube Xtreme Grease: ........................... $930
- Reduced Pump repairs by 96% & replacements by 66%
  By Using: ............................................................... $Value Unknown

Annual Savings - Lubricant Related Downtime

- Reduced 40hp Fan Bearing Failures resulted in
  Downtime Savings: ........................................... $54,000
- Reduced Cooker Bearing Failures resulted in
  Downtime Savings: ........................................... $151,200

Annual Savings - Waste Expense

- Before Using Certified’s Returnable Bulk Storage Tanks,
  Disposed Of 284 Empty Drums @ estimated $25 Each: …$7,100

Value Added Contributions

- 4 Plant Surveys: Typical Charge of $1800/each
- 2 Lubrication Training Seminars: Typical Charge $1375/ea
- 24 Certified Representative Service Visits
- 2 Grease Pumps Provided @ No Charge $4,400

Savings Summary

Parts Repair & Replacement ………$128,528
Lubricant Related Downtime ………..$205,200
Waste Expense ………..$7,100

Total Annual Savings  $340,828

Additional Value

- Plant Surveys ………..$7,200
- Training Seminars ………..$2,750
- Equipment ………..$4,400

Total Value $14,350

Total Annual Savings $340,828

Total Savings Over 10 Year Relationship $3,408,280
Value Recognition Report  
- Protein Conversion Plant -

Cost Reductions Calculations:

Lubricant Consumption & Inventory Reduction
Annual Grease usage reduced from 41,600Lbs to 15,000Lbs. Hydraulic Oil and Gear Oil annual usage reduced from 15,600 Gal. to 5,610 Gal. Lubricants lasting 63% longer. Inventory reduced from 2 hydraulic oils to 1 hydraulic oil, reduced from 4 gear oils to 2 gear oils.

Parts Repair and Replacement Cost Reduction
- Reduced cooker bearing failures from 3+ per year to 0.4 per year (only 2 failures in 5 years) by switching to CCL-500 grease. Savings of $6,988 per year in reduced parts and repair costs: 2.6 less bearings replaced or repaired @ 1968 each = $5116. 2.6 less bearings replaced or repaired = $1872 (4 men x 12 hours each @ $15Hr)
- Reduced gearbox repairs by 63% and replacements by 64%. Savings of $120,400 per year: Before – Replaced 28 gearboxes per year @ $3500 each = $98,000 (parts & labor) Now – Replace 10 gearboxes per year @ $3500 each = $35,000 (parts & labor) Savings of $63,000. Before – Repaired 258 gearboxes per year @ $350 each = $90,300 (parts & labor), Now – Repair 94 gearboxes per year @ $350 each = $32,900 (parts & labor): Savings of $57,400.
- Reduced 40hp fan motor bearing failures by 75%. Savings of $210 per year: Before – Replaced 2+ fan motor bearings per year @ $140 each = $280 (parts & labor). Now – Replace 0.5 per year @ $140 each = $70 (parts & labor): Savings of $210.
- Reduced Steadman hammermill bearing failures by 75%. Savings of $930 per year: Before – Replaced 8 hammermill bearings per year @ $155 each = $1240 (parts & labor). Now – Replace 2 per year @ $155 each = $310 (parts & labor): Savings of $930. Before – Replaced 3 pumps and repaired 208 pumps per year. Now – replace 1 pump per year and repair 8 pumps per year. Savings information not provided

Lubricant Related Downtime Reduction
- Reduced 40hp fan motor failures by 75%, $54,000 Downtime Savings (downtime calculated at $300 min. Average downtime to replace 1 bearing is 2 hr or $36,000). Before – Downtime of Replaced 2+ fan motor bearings per year @ $36,000 each = $72,000 (parts & labor). Now – Replace 0.5 per year @ $18,000 each = $18,000 (parts & labor): Savings of $54,000.
- 86% reduction in Cooker Bearing replacement & repair. (downtime calculated at $100 min. because only one third of production is lost. Average downtime to replace 1 bearing is 12 hr or $72,000). Before – Downtime related to 2.6 cooker bearings replaced or repaired per year @ $72,000 each = $187,200 (parts & labor). Now – Replace 0.5 per year @ $36,000 each = $36,000 (parts & labor): Savings of $151,200.

Waste Expense Reduction
Before - This plant paid $7,100 per year to dispose 284 empty drums @ $25 each. Now – Certified provides lubricants in returnable tote tanks. This plant now pays $0 drum disposal. Savings of $7100.
Now - PPC generated 6,272 gallons less waste oil because oils are lasting 63% longer.
Account History: This is a Poultry Kill Plant. Cost of downtime is estimated at $350 per minute.

Certified Labs’ Objective: Develop a reliability partnership to reduce downtime, lower maintenance & operating expenses, and drive proactive maintenance procedures for continuous improvement.

Reduced Lubricant Consumption & Inventory

- Reduced Grease and Oil Consumption by Approximately 50%
- Reduced Quantity of Different Greases and Oil Inventoried by 33%

Annual Savings - Parts Repair, and Replacement

- Reduced Lift Truck Bearing Replacements By 70% Per Year By Using Premalube Red Grease: $4,273
- Reduced Picker Hub Bearing Replacements By 78% Per Year By Using Premalube Xtreme #1 Grease: $10,046
- Extended Motor Oil Change Intervals 100% From 250 Hours to 500 Hours By Using Strata XL Motor Oil: $900
- Reduced Gearbox Repair & Replacement Costs 63% Per Year By Using Certop Gear Oil: $40,307
- Reduced Hydraulic Pump Replacements by 94% By Using Hi-Top Hydraulic Oil: $14,273

Annual Savings - Lubricant Related Downtime

- Reduced Hydraulic Pump Failures 94% Resulted in Downtime Savings: $39,200

Annual Savings - Waste Expense

- Before Certified Installed Returnable Storage Tanks This Plant Paid $25 Each to Dispose of 200 empty drums per year... $5,000

Value Added Contributions

- 4 Plant Surveys: Typical Charge of $1800/each
- 2 Lubrication Training Seminars: Typical Charge $1375/ea
- 24 Certified Representative Visits Each Year.
- $6800 of Dispensing Equipment and Storage Tanks Provided.

Savings Summary

Parts Repair & Replacement ......... $69,799
Lubricant Related Downtime ............. $39,200
Waste Expense ............ $5,000
Total Annual Savings $113,999

Additional Value

Plant Surveys ............ $7,200
Training Seminars ...... $2,750
Equipment ............... $6,800
Total Value $16,750

Total Annual Savings $113,999
Estimated Savings Over 4 Years $455,996
Value Recognition Report
- Poultry Kill Plant -

Cost Reductions Calculations:

Lubricant Consumption & Inventory Reduction
Overall lubricant usage reduced by 50% per year, average lubricant lasting 50% longer. Inventory consolidation: reduced from 3 hydraulic oils to 2 hydraulic oils, 3 gear oils to 2 gear oils, and 3 greases to 2 greases.

Parts Repair and Replacement Cost Reduction
- Reduced Lift Truck Bearing Replacements By 70% Per Year By Using Premalube Red Grease. Savings of $4,273 per year. (364 less bearings used @ $7.49 each = $2,726, 364 less bearings replaced @ 17 minutes repair time @ $15Hr. repair rate = $1547).
- Reduced Picker Hub Bearing Replacements By 78% Per Year By Using Premalube Xtreme #1 Grease. Savings of $10,046 per year. (364 less bearings used @ $12.60 each = $4,586. 364 less bearings replaced @ 1 hour repair time @ $15Hr. repair rate = $5,460)
- Extended Motor Oil Change Intervals 100% From Every 250 Hours to 500 Hours By Using Strata XL Motor Oil and Oil Analysis. Savings of $900 maintenance labor per year. (60 less motor oil changes @ $15 per hour = $900)
- 94% Reduction of Hydraulic Pump Replacements By Using Hi-Top Hydraulic Oil. Reduced hydraulic pump failures from 4 per year @ $3,800 each plus $30 labor to 1 failure every 4 years @ $950 per year plus $7.50 labor. $15,250 - $957 = $14,273. Savings of $14,273 per year

Lubricant Related Downtime Reduction
Downtime Savings From Reduced Hydraulic Pump Failures. Average downtime when hydraulic pump fails is 30 Minutes. Reduced annual pump downtime from 120 minutes to 8 Minutes. 120 X $350 = $42,000. 8 X $350 = $2,800. $42,000 - $2,800 = Savings of $39,200.

Waste Expense Reduction
Before Certified installed oil storage tanks this plant paid $5,000 per year to haul off 200 empty drums @ $25 each. Savings of $5,000 per year.

Equipment Provided
4 oil pumps and 4 storage tanks provided at no charge. Savings of $6,800.
Case Study: **Industrial Hydraulic Systems**

**Product:** HI-TOP FG Hydraulic Oil & SYSTEM PURGE

**Site:** Pork Processing Facility

**Problem:**
This account uses two 600 gl hydraulic systems operated by six 8hp Bosch hydraulic pumps. Deposit build-up in the hydraulic system caused increased operating temperatures, premature pump wear, increased power consumption and ruptured seals and lines due to pressure spikes. These problems resulted in processing downtime, increased energy costs and parts replacement exceeding $28,000 annually.

**Proposed Solution:**
LubeMaster SYSTEM PURGE has been proven to remove deposits, neutralize acids and prepare the metal surfaces. This action allows the high concentration of performance in HI-TOP FG ISO68 hydraulic oil to perform at maximum capability.

**Study Layout:**
The initial temperature, pressure and ampere measurements were made while the system was in operation. Temperature measurements were made using a Raytec RAYNGER ST20 Pro Noncontact IR Thermometer which has an accuracy of ±2°F up to 400°F. Measurements were taken and averaged on areas on the pump housing, on the flange and on the casing. Pressure was recorded from the system gauges. Ampere (color legs) measurements were taken from the exclusive circuit box (3 phase, 460v) using a Fluke 30 Clamp Meter. Energy consumption was determined using the following equations:

\[
\text{460Volts} \times \frac{\text{brown + orange + yellow}}{3} \times \sqrt{3} = kW = kVA \times 0.85PF
\]

The power factor for the motors was determined to be 0.85 under load. LubeMaster SYSTEM PURGE was added and allowed to circulate while the system was running for an additional 1 hours. The existing oil and LubeMaster SYSTEM PURGE was drained while the system was hot, HI-TOP FG ISO68 was introduced with new filters.

**Results:**

<table>
<thead>
<tr>
<th></th>
<th>Pump Temp °F</th>
<th>Line Pressure (psi)</th>
<th>Energy (amps)</th>
<th>Energy Cost @0.06kW-hr $3120 hr/yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before</td>
<td>128</td>
<td>1200</td>
<td>32</td>
<td>$8112</td>
</tr>
<tr>
<td>After HI-TOP FG &amp; SYSTEM PURGE</td>
<td>99</td>
<td>500</td>
<td>19</td>
<td>$4804</td>
</tr>
<tr>
<td>Reduced</td>
<td>24%</td>
<td>58%</td>
<td>40%</td>
<td>$3308</td>
</tr>
</tbody>
</table>

**Data Interpretation:**
The decrease in operating temperature, pressure and energy consumption indicates that the system is operating more efficiently. LubeMaster SYSTEM PURGE removed the deposits that were the result of oxidation allowing HI-TOP FG ISO68 to lubricate and protect the system. This will result in reduced energy costs, downtime, parts replacement, and labor cost to exceed $28,000 annually.