Techni-Tips 90
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Lubrication of the Engines Supplying Power to Wastewater Treatment Plants

Large internal combustion engines are found at many wastewater treatment plants. They are used to produce electricity for the power needs of the entire plant or as standby power should the electric power supplied by the municipal facility fail. The power generated by the engines is used to drive blowers for aeration, or compressors, pumps and other mechanical equipment such as sludge collectors, digester stirrers and power-operated valves. The engines are occasionally a source of cogeneration, providing both power and heat.

Generator with Cat 3508 engine

These engines may run on gas, diesel or dual fuel. Gas or dual-fuel engines are usually chosen in order to use the methane generated in the sludge digestion process at the plant. Most or all of the methane produced is drawn from the digesters and compressed into storage tanks. Any excess methane is either flared off or sold to surrounding communities or industries.

Electricity is generally the most convenient source of power, especially for operating small units distributed around the plant. In fact, most of these units are made for electric operation.

Because of this, many plants use their sludge gasses to power the engines that run the generators. Some of these engines may serve only in case of failures of the municipal supply, or to reduce the excessive demand for electricity during peak loads. It is desirable that the engine efficiently deliver the horsepower needed. Therefore, a thorough preventive maintenance program should be established for this equipment.

Whether or not to convert the gas to power and what type and capacity of engine to use are economic considerations. Conversion of sludge gas to standby power can fulfill a major need in most plants. The type of engine generally operating on sludge gas is the high-compression, dual-fuel engine that can operate over the entire range from minimum ignition fuel oil requirements and gas, to 100 percent fuel oil with no gas.

Supercharged engines – with automatic throttling of air supply to maintain more constant air-to-gas ratio – appear to be the engine of choice under conditions of partial load that are frequently found in engine generator sets.

Wastewater treatment plant designers have found that dual-fuel engines provide a degree of versatility in that such engines may operate on fuel oil or fuel oil and gas combinations when sufficient quantities of gas are not produced to operate the engine. Regardless of the type of fuel, however, a top-quality engine oil is recommended for most of these engines. Some gas engines require a low-ash oil, and these engines should be supplied with the same top-quality level of oil.

Lubricant Recommendations

Some low-ash oils are available on the market, but most requirements can be met with LE's Monolec® Natural Gas Engine Oil (8945), Monolec® Landfill Gas Engine Oils (8947 & 8949), Monolec Ultra® Engine Oil (8800) or Monolec® GFS Engine Oils (8420-8450). With their premium formulation of base oils, additives and inhibitors, these oils far outperform conventional oils. Wastewater treatment plant operators should investigate these high-quality oils for their economics and energy savings.

Below are several application-specific suggestions, but we advise you to consult your *OEM Lubrication Guide* or LE's Technical Services Department for the most accurate product recommendations.

Diesel, Gas or Dual Fuel Engines

Crankcase

Gas/Dual Fuel

- Monolec® Natural Gas Engine Oil (8945)
- Monolec® Landfill Gas Engine Oil (8947 & 8949)

Gas/Dual Fuel & Diesel

- Monolec® GFS Engine Oil (8420-8450)

Diesel

- Monolec Ultra® Engine Oil (8800)

Fuel Supply Additive

Gas/Dual Fuel

- L-X® Heavy Duty Chemical Supplement (2300)

Gas/Dual Fuel & Diesel

- BTU⁺ Diesel Fuel Improver (2410-2420)

Grease Fittings

- Almaplex® Industrial Lubricant (1275)
- Almagard® Vari-Purpose Lubricant (3752)
- Monolec® Multiplex Industrial Lubricant (4622)

Oil-Lubricated Points

- Any Monolec® Engine Oil

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