TECHNICAL BULLETIN ON THE USE OF MILITEC-1 TO LUBRICATE AIR COMPRESSORS AT A POWER GENERATING STATION

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The Plant Supervisor for Maintenance and Operations at a power generating station in the mid-Atlantic states, reports that he and his crew have been using MILITEC-1 to lubricate compressors there for almost 3 1/2 years. During this time they have performed thorough evaluations of MILITEC-1's ability to reduce friction and thereby keep equipment running and maintenance costs down. Highlights of his report follow.

WORTHINGTON AIR COMPRESSORS

Four Worthington air compressors (size 4 3/8 x 2 1/4 x 1 5/8) are used to service the gas turbines. They operate on demand and automatically start up when air pressure falls to 125 psi. They run for about 1 to 1 1/2 minutes, automatically shutting down when the pressure reaches 150 psi. It is usually between 10 and 35 minutes that the pressure will again be down to 125 psi requiring another start up.

One compressor is 3 years old while the others date back to at least 1978. Worthington no longer makes these compressors and spare parts are not available. The biggest problem is the cast aluminum rods that get so worn they become egg-shaped and will last only 10 to 12 months at best. Before MILITEC-1 was installed, there were frequent catastrophic failures. Seals and gaskets went bad and the oil would leak out. The compressors don't have a low lube level alarm so there was no timely signal of the problem. A complete failure would drop the air pressure below 70 psi which would trigger a gas turbine low air alarm, thereby signaling a problem. The compressor can run for awhile after spilling a lot of oil and, prior to a complete failure, a check of the compressor would not only show the spill (on the floor) but there would be a loud knocking noise. The damage would be enough to require a rebuild.

With spare parts either unavailable or very difficult to obtain, any failure could mean replacing the air compressor and related equipment on the system (available compressors would not fit the old system). The cost of a rebuild with spare parts available would be $300 for the parts and about $300 labor. However a new system would cost $2,000 to $3,000 plus about $1,500 labor.

Three years ago, five ounces of MILITEC-1 were added to the 2 1/2 quarts of 30-weight non-detergent compressor oil in each of the four units. There has not been a failure since then. The oil is changed every six months and five more ounces of MILITEC-1 are added.

Earlier this year, one especially convincing event occurred. The moisture drain on the air line of one compressor failed. This resulted in a 50/50 mixture of water and oil in the compressor crankcase. This normally would have caused enough damage to the internal parts that a rebuild would be required. However, the compressor continued to operate normally and no damage was found. The moisture drain was repaired, new oil installed and the compressor put back into service. It has been operating fine since then.

Over 3 years, the cost of the MILITEC-1 for the four compressors combined was about $170. Had spare parts been available, MILITEC-1 would have saved about $12,000 in rebuilds. But the full systems were going to need replacement and this would have cost $14,000 to $18,000 plus some rebuilds. Estimated savings have been at least $100 for every $1 of MILITEC-1.

FUEL ATOMIZERS

To start up the gas turbines, a small air compressor is used to atomize fuel. The compressors operate for only ten minutes each startup. Last year there were 120 starts. Since the compressors see very little use, they last a long time. However, there are 16 of these and they were all installed in 1968. The inboard side of the compressor has greased bearings while the outboard side has an oil-lubricated gear train that runs from one

blower lobe to the next. A ticking noise was heard in one of the units, indicating a failing bearing. One ounce of MILITEC-1 was added to the 1/2 quart of 30-weight non-detergent oil. Right away the ticking disappeared. That was in early 1992 and there has been no ticking or other sign of failure since.

Since all the units are the same age, they were all nearing the end of their life. Replacement parts for these are no longer available and a new system would cost $800 plus $600 labor. To keep them operating, MILITEC-1 was added to them all. The major benefit using about $175 worth of MILITEC-1 to date is suspending the need to invest over $22,000 in new equipment.

UPDATE

The Plant Supervisor for Maintenance and Operations was absent several months ago when one of the Worthington compressors went down. He was called by a technician who said the problem was the rings which would need replacement. The Supervisor approved the replacement and the work was done. When he returned, he found that the problem was not the rings but rather the air dryer. He said that MILITEC-1 was still protecting the Worthingtons and there has been no sign of needed replacement of wear parts although the one compressor now has new rings due to a mistake in assessing a problem.

DIESEL ENGINES

The plant uses four Cummins 1968 300 hp diesel engines for starting engines backup power generation. These come on at full load with no warmup. Although they only operate only sporadically, they take a lot of abuse from these startups. They have been lubricated with MILITEC-1 for 4 1/2 years and have not had any problems for the entire period. Usually they each will need repair work once a year.