

TECHNICAL BULLETIN ON MILITEC-1 FOR LUBRICATING SLIDING CLUTCHES

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Background: A power generating station in the mid-Atlantic region has 16 gas turbine generators. On average, each of the gas turbines is started up about 20 times per year, so total startups for all the gas turbines numbers about 320. Four of the gas turbines are started using diesel engines while the remaining twelve are started by electric power.

The sliding clutches used for the electric startups are made by Allison while the four others are made by Twin Disk. All of the sliding clutches work on the same principle. The sliding clutch is moved into position with the fixed clutch so that a full circle is formed with interlocking teeth. The sliding clutch is moved into this position by air pressure that overcomes the resistance of a spring device that was keeping the clutch components apart. As the ignition speed of the gas turbines of 1100 rpm is attained, the air pressure is shut off, but the clutch stays in position under tension until the gas turbine reaches about 1800 rpm at which point the tension is relaxed and the springs do their job disengaging the clutch. The sliding clutch is moved back into its resting position.

Problem: The sliding clutches would experience a failure every 5th or 6th start. This calculates to more than fifty failures a year. The failures were mainly due to lubrication failure along the clutch splines. Oils did not work as they would sit idle for too long. Dirt would settle in the oil and the resulting mixture would become gummy, with dirt dragged into the moving parts at startup. A number of greases were also tried. The Marfak grease and a number of moly greases were found to settle out and also collect dirt. A dry moly coat was tried but it would sling off over time and not be in place when needed.

Solution: About five years ago, MILITEC-1 was applied with a sprayer and then wiped along the splines. Since then, with periodic MILITEC-1 application,

there has been only one start failure and that was due to a blown o-ring. This calculates out to the avoidance of more than 250 failures over the period MILITEC-1 has been used.

NOTE: The four diesel engines used to start up four of the gas turbines are Cummins 1968 300 hp diesel engines. They are operated sporadically and sit idle for weeks at a time. Once a month, if they have not been used since the past month, they are started up gently and left at idle for a short period. However, when used to start up the gas turbines, these engines are started up full blast with no warm-up. Historically, they have needed repair work once a year. They have now operated with MILITEC-1 treatment for almost 5 years without any problems or repairs.