

APPLICATION SOLUTION

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Industry: Aircraft

Customer: Major Helicopter Manufacturer

Challenge: Monitor critical grease-lubricated powertrain bearing dependably while surviving the tough helicopter environment. Accelerometers are located on the rotor swashplate assembly and the bearing housings of the tail rotor drive train. The swashplate sensors are exposed to the airstream as the helicopter is in flight while the drive train accelerometers are exposed to temperature, grease and hydraulic fluid.



Solution: Initially, the customer was installing and removing the sensor when they wanted to capture readings. They did this to avoid subjecting the sensor to undo wear and tear, and to make sure the signal was of good quality.

The helicopter manufacturer's Test Engineer said, "The original vibration signal must be strong, so that the signal can be extracted from the naturally noisy helicopter environment. We tested a couple of the specified Wilcoxon sensors by putting them onto a shaker table and subjecting them to extreme heat, then extreme cold and buzzing them. After all this the sensors still worked great." The findings led the customer to the realization that they could leave the sensors installed and cause less trauma since the human interaction was eliminated.

A bearing is not a clean place. It is usually exposed to grease as well as other forms of liquid and moisture. The engineer tested the Wilcoxon sensors for these factors before he suggested leaving them on the bearings. He found a bucket, added lots of bearing grease, hydraulic fluid, and a sensor. Then he placed the bucket in an environmental chamber. A week later, the only change in the sensor was to the exterior color. It held its calibration and operated flawlessly.

The Wilcoxon 908TS-1 and 908TS-2 vibration sensors, which feature integral cables, were designed and built specifically for this helicopter manufacturer to meet their specs. Since Wilcoxon Research builds most of their sensors for harsh industrial applications, they were readily able to meet the rugged design requirements. Another vendor was originally used for their sensors, but the sensors were not Electromagnetic Interference (EMI) protected. This caused radio frequency signals to produce false vibration readings. Because the Wilcoxon 908TS-1 and 908TS-2 are EMI protected, this problem has been eliminated.

Benefits:

- * No false readings due to EMI pick-up in the accelerometers
- * Rugged design resists attack by chemicals and fluids
- * Critical measurements can be made at any time because of permanent sensors
- * Sensors designed to meet application, electrically and mechanically

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