

Condition monitoring (CM) of gearbox is a crucial activity due to its importance in power transmission for many industrial applications. Monitoring temperature is an effective mean to collect useful information about the healthy conditions of the gearbox. This study investigates the use of a novel wireless temperature node to monitor and diagnose different faults on a gearbox transmission system under different conditions. The wireless temperature node was fabricated with a novel feature that it is supplied by a thermoelectric generator module mounted on the gearbox house to be monitored so that the measurement system avoids the shortage of using a wired power sources or the requirement for recharging or changing batteries. Moreover, the temperatures from lubricating oils and housing are modelled empirically to implement a model based detection. The results show that this monitoring approach allows a number of common faults: tooth breakage, oil shortage, and shaft misalignment to be separated under different loads, which demonstrates the outstanding performance of the proposed system and thus suitable for online and automated condition monitoring.