Abnormality Detection of Traction Diesel Engines Using Vibration Analysis in Octave Bands

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A railway traction system consists of rotating machines such as electric motors, gears, diesel engines, and Cardan shafts. These machines are essential parts for a train to run. Therefore, we are developing a condition monitoring system (CMS) that detects failures of the machines in the early stage to prevent transport disorders. The CMS monitors the vibrations of a machine and detects abnormal vibrations with a machine learning algorithm that is based on nearest-neighbor analysis. In the CMS, octave-band analysis is performed to extract feature vectors from vibration data. We conducted a running test to verify the performance of the CMS. The test results show that the CMS can distinguish the simulated abnormal vibrations from the normal ones without false detections.