



VISVESVARAYA TECHNOLOGICAL UNIVERSITY

A PROJECT REPORT ON

RAILWAY TRACK CRACK DETECTION

UNDER THE GUIDANCE OF

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SUBMITTED BY

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**2KA09EC002
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2012-13

ABSTRACT

The Indian railways, today has 1,16,670Kms of total track over a route of 63,974Kms. It has the world's 4th largest railway network after those of United States, Russia and China. It is the world's 2nd largest commercial or utility employer, with more than 1.36 million employees. Despite boasting such impressive figures we find that Indian rail network, associated safety infrastructure facilities have not kept up with the aforementioned proliferation. Our facilities are poor when compared to international standards and as a result, we have been in having frequent derailments that have resulted in severe loss of valuable human lives and also property. A statistic reveal that approximately 60% of the rail accidents have derailments as their cause, of which about 90% is due to cracks on the rails either due to natural causes (like excessive expansion due to heat) or due to antisocial elements. These cracks and other problems with the rails generally go unnoticed due to improper maintenance and the currently irregular and manual line monitoring that is being carried out in the current situation. The core of our proposed crack detection is based on using LED (Light emitting diode)-LDR (Light dependent resistor) that functions as crack detector. The LED will be attached to one side rails and LDR to the opposite side. During normal track the light of LED does not fall on LDR, so the LDR will be high and when a crack is there the light falls on LDR and the resistance of the LDR is reduced.

The amount of reduction of resistance will be directly proportional to the intensity of crack. The mechanical device stops when the crack is detected and to locate the position we use the GSM or GPS module which sends latitude and longitude of the location to the concerned authority. The motors are driven by the 12V dc supply.

We find that the commonly employed rail crack detection schemes in foreign countries are usually Ultrasonic or Eddy current based schemes which most of reasonable good accuracy in most cases. However the one characteristic which the above mentioned methods have in common is that they are both expensive, which makes them ineligible for implementation in the current Indian scenario.

Also, ultrasonic can only inspect the core of materials, that is, the method cannot check for surface and near surface cracking where many of the faults are located. In addition, ultrasonic inspection is usually restricted in low speeds of around 20-30mph, which limits the viability of testing many tracks regularly. Many of the most serious defects that can develop in the rail-head can be very difficult to detect using the currently available inspection equipment. This project can be implemented on a very large scale, hence reducing the chances of accident, decreasing the man power required and increasing the accuracy of detection.