

CHAPTER 1

INTRODUCTION

1.1 Problem overview

The project focuses on the development of a wireless system that can inspect the pipeline networks internally. Goal of the project is to design and build a prototype of a defect detector that can navigate through a pipeline network.

Inspection robots are used in many fields of industry. One application is monitoring the inside of the pipes and channels, recognizing and solving problems through the interior of pipes or channels. Automated inspection of the inner surface of a pipe can be achieved by a mobile robot. Because pipelines are typically buried underground, they are in contact with the soil and subject to corrosion, where the steel pipe wall oxidizes, and effectively reduces the wall thickness. Corrosion also occurs on the inside surface of the pipe and reduces the strength of the pipe. Along with corrosion other defects like scaling, cavities, cracks and other geometrical defects like pitting and bends also occurs in pipelines. If a crack goes undetected and becomes severe, the pipe can leak and, in rear cases, fail catastrophically. Extensive efforts are to be made in order to mitigate defects. [2]

Pipe inspection is necessary to locate defects occurring due to wear while the pipe is transporting fluids. This ability is necessary especially when one should inspect an underground pipe. In this work, Internal Pipe Defects Detector (IPDD) with ability to move inside horizontal and vertical pipe sections has been designed and fabricated.

The device consists of a motor for driving and camera for implementing visual inspection and a battery pack to power the device wirelessly.