TANGENTIAL RADIOGRAPHY METHOD OF LARGE DIAMETER PIPES USING COMPUTED RADIOGRAPHY SYSTEM

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TABLE OF CONTENTS

	PAGE
ACKNOWLEDGEMENT	i
TABLE OF CONTENT	ii
LIST OF TABLES	iv
LIST OF FIGURES	v
ABBREVIATIONS	vii
ABSTRACT	viii
ABSTRAK	ix
CHAPTER 1 : INTRODUCTION	
1.1 Background	1
1.2 Problem Statement	4
1.3 Objectives	4
1.4 Significance of Study	5
CHAPTER 2 : LITERATURE REVIEW	
2.1 Non Destructive Testing	6
2.2 Radiography Testing	7
2.3 Defects and Discontinuities	11
2.4 Computed Radiography	13
2.5 Imaging Plate	15
2.6 Image Quality Indicators	16
2.7 Tangential Radiography	17
CHAPTER 3 : METHODOLOGY	
3.1 Materials and Equipment	22
3.2 Process Flowchart of Project	24
3.3 Method	25
3.3.1 Set Up	25
3.3.2 Image manipulation and data collecting	28

Abstract

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Nuclear Radiation plays an important part in industrial application especially in radiography. Radiography is one of NDT techniques used for evaluation on material integrity or engineering structure. The tangential radiography method of large diameter pipes using the computed radiography system is a study or a method to determine the thickness of an industrial pipe. The process is being done using a radiographic system and the images produces were scanned, interpreted and analysed using the ISee program. From this program, we could actually manipulate or enhance the image to get a better picture of the image. We can also collect various dire information from this program. Apart from that, we can see if there is any cracks or reduction on the pipe's diameter due to corrosion or other externalities. This study is to compute or measure the diameter of the pipes without removing the insulation layer. This is important because in pipes used in industrial, it is very crucial to spot any weariness but at the same time using the most cost efficient, precise, and safest way possible. I used 2 pipes in this study. One with a diameter of 14 cm and width of 1cm while the other with a diameter of 6cm and a width of 0.2cm. The sizes of this pipes are chosen because these are the pipes similar to what is being used in the industry currently and we would like to simulate the actual procedures done on actual industrial pipes. Overall results shows that although some data are not exactly the same with the actual measurements, it is still can be used and any faults or errors may come from the one conducting the experiment, externalities or due to some errors in using the ISee program. However, this method has been proved to be very efficient and with further work done added with more experience,can be very precise.

Chapter 1 : Introduction

1.1 Background

Computed Radiography uses almost the same equipment as conventional radiography except that in place of a film to create the image, an imaging plate (IP) made of photostimulable phosphor is used. The imaging plate is housed in a special cassette and placed under the body part or object to be examined and the x-ray exposure is made. Hence, instead of taking an exposed film into a darkroom for developing in chemical tanks or an automatic film processor, the imaging plate is run through a special laser scanner, or CR reader, that reads and digitizes the image. The digital image can then be viewed and enhanced using software that has functions very similar to other conventional digital image-processing software, such as contrast, brightness, filtration and zoom.

There are a few advantages that set apart digital radiography from the conventional methods. First, it gives an immediate observation of radiographic images. The image acquisition is much faster - image previews can be available in less than 15 seconds. This phosphorus-plate technology requires placement of the irradiated censors irradiated sensor in a processing device to scan it and put the information into a computer so that the image can be viewed. The conventional technique however, has a delay in reading the images and forces us to undergo numerous process that involves chemicals to produce the image. By eliminating this process, not only it will give an even faster and more accurate image, it will also remove the hassle procedures that had to be done in conventional methods. Furthermore, it will also decrease the chance of the image being tempered with due to cutting of some steps. Other than that, the digital radiographic method will also provide the ability to enhance the image produced. It allows us to change the contrast,