

WOOD INSPECTION USING DIGITAL RADIOGRAPHY

MUHAMMAD HAFFIZAL BIN MUSA

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ABSTRACT

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The non-destructive testing nowadays has become more advanced in order to follow the development of technology and new trend. For example in radiography, one technique called digital radiography that uses the advanced computer technology, scanner machine and data editor established. Meanwhile, research was made based on the digital radiography technology. This research is based on wood inspection using digital radiography to obtain the high quality image of radiography. The inspection was made because there was no other inspection regard to the wood. The purpose of this inspection is to determine the relationship of penetration power and source-to-film distance with the image quality. Besides, the purpose is to evaluate the wood thickness with the image quality. In addition, the inspection done to establish basic exposure chart that include parameter such as penetration power, exposure time, current and wood thickness. These parameter affect the quality of image displayed on the monitor. There are three type of wood used; Akasia, Perah, and Meranti. The three different type of wood divided into three thickness; 2 inches (50.2mm), 3 inches (76.2mm) and 5 inches (127mm).

CHAPTER 1

INTRODUCTION

1.1 Background of radiography technique

Radiography is one of the methods to detect discontinuities in non-destructive testing. Non-destructive testing can be summarized as the testing that done on some material without affecting the size, shape, ability and strength of material. Conventional radiography is a non-destructive techniques that requires exposing film to X or gamma rays that have penetrated a specimen. When exposing the film, the parameters that be considered are radiation source, specimen, film, discontinuities and darker areas when the conventional radiography film was processed. X or gamma rays used in the radiography because of its higher penetration power. Besides, X or gamma ray is electromagnetic spectrum with energy indirectly proportional to their wavelength, have no electrical charge or mass and travel in straight lines at the velocity of light. Although, X or gamma ray can be scattered by matter where as that amount of scattering is directly proportional to density of matter and indirectly proportional to ray energy. In conventional radiography, the absorption rate depends on the test material where those factors should be concerns in order to record the absorption rate on the conventional radiography film.