STUDY OF RAIN ATTENUATION ON A DIGITAL MICROWAVE RADIO LINK IN SELANGOR (MALAYSIA)

Thesis is presented to fulfil the requirement of Advanced Diploma in Electrical Engineering of MARA Institute of Technology

MOHD. JANI BIN SARPON, Dip. in Elect. Eng.(UTM)

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Department of Electrical Engineering
School of Engineering
MARA Institute of Technology
40450 Shah Alam
Selangor
Malaysia

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Summary

Rain effects play an important role in the overall system performance and reliability of terrestrial microwave communication systems for frequencies above 10 GHz. The magnitude of these effects depends on rain charateristic. Attenuation due to rainfall restricts the path length of microwave system and the use of higher frequencies for line of sight communication.

This project report presents results of the propagation and rainfall measurements undertaken in Petaling Jaya (Selangor). Data is based on two months (Aug.-Oct.) of simultaneous measurements of the signal level as well as rainfall rate on an 11.2 GHz terrestrial link. The measured data are used to investigate the rainfall rate and its effects on the performance of the existing digital radio link.

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Chapter 1

INTRODUCTION

1.1 THE FRAMEWORK

The rapid progress on the development of digital radio-relay systems is influenced by following factors:

- network transition from analog to digital;
- technological progress;
- growing transmission needs; and
- alternative transmission media.

Digital radio-relay systems applications range from long-haul transmission to local networks, and from high to low transmission capacities.

The major topics discussed in this project report are:

- transmission performance;
- propagation impairments that adversely affect transmission performance;
- basic equipment configurations and designs;
- system configurations;
- equipments configuration for rain rate measure ment;