INVESTIGATION OF RADIO BROADCASTING INTERFERENCE IN BANGKOK

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ABSTRACT

In Thailand, nowadays, we are confronting with the problem of the interferences which occurred in the radio services; especially the interforences from radio broadcast transmitters. This paper is an attempt to find the best methods for measuring bandwidth, frequency stability, and spurious emission which are considered appropriate for Thailand , and the bandwidth, frequency stability, and spurious emission of seven radio broadcast stations were measured. The results came out that those radio broadcast stations transmitted within the limitation set up by the ITU and FCC, but the best methods of measurement found out by the author and experiences gained from this thesis will serve as a potential guidance work for further study.

บทย่อ

ในปัจจุบัน ประเทศไทยกำลังเผชิญปัญหาของการรบกวนที่เกิดขึ้นกับการติดต่อสื่อสารซึ่งใช้คลื่นวิทยุ โดยเฉพาะอย่างยิ่ง การรบกวนที่เกิดจากเครื่องส่งวิทยุกระจายเสียง วิทยานิพนธ์ฉบับนี้ เป็นการรวบรวมผลการค้นคว้าเพื่อหาวิธีการที่เหมาะสมสำหรับประเทศไทย ในการวัด Bandwidth, Frequency stability และ spurious emission ของเครื่องส่งวิทยุกระจายเสียง ผลจากการทดลองกับสถานีวิทยุกระจายเสียง ๗ สถานี ปรากฏว่า สถานีวิทยุกระจายเสียงเหล่านี้ ส่งคลื่นวิทยุอยู่ในกฎเกณฑ์ของ ITU และ ICC แต่วิธีทดสอบที่ได้จากการค้นคว้าและความรู้ที่ได้รับจากวิทยานิพนธ์ฉบับนี้ จะเป็นแนวทางสำหรับการค้นคว้าในขั้นต่อไป

PREFACE

Nowadays radio broadcast stations, especially in medium frequency band are crowded in Bangkok. Many stations arose just only for business purposes and many stations lack of knowledges and testing instruments to control the transmitters according to the "Rules and Regulations" of ITU and FCC. The situation mentioned above has resulted in one of serious problem, i.e., the adjacent channel interference and created interference to others radio services.

The Post and Telegraph Department, practically deals with the registration of the frequencies. In order to remedy the above situation, specific authority must be established to control the emission of transmitters.

Before conclusion can be done, study of characteristics of emission of various radio broadcast stations should be made. The SRI (Stanford Research Institute) which is the research agent in Thailand under the supervision of MRDC (Military Research and Development Center) realized above situation and let the author did it as a thesis for the Degree of Master of Engineering and provided the materials, electronic equipments, and man power needed in this study.

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INTRODUCTION

Nowadays there are lots of radio broadcast stations in Thailand. However, these radio broadcast stations are not seriously controlled. Some of them transmit RF signal which interfere the adjacent channels and other various radio services which cause disturbances to the radio listeners and to the other public services which depend on the radio services in conveying the message.

The purpose of this thesis is to find a simple method which needs only a small amount of equipments with low expense and is appropriate for Thailand in checking various radio broadcast transmitters. The various radio broadcast transmitters should be checked whether they transmit RF signal which interfere the adjacent channels and/or other radio services. The Rules and Regulations that are considered a principle for experimenting belong to the ITU and FCC which every country accepts and follows, including Thailand, one of the members of ITU.

The most essential componont for the research is the experimentation to prove that the method selected for the research is the right one which can be used for checking the radio broadcast transmitter by experimenting with the radio broadcast transmitter which is in the services nowadays. In this regard, it is necessary to acquire the permission from the authority of the various radio broadcast stations to carry out the experiment with the transmitters of those radio broadcast stations.

To gain a complete result it is also necessary to have the experiments

with every radio broadcast station , but in the actual experiment it was impossible to carry out the experiment with every radio broadcast station due to the fact that the author has no authority to carry out the experiment without the approval from the authority of the various radio broadcast stations. Therefore, only seven of the radio broadcast stations,which extend their cooperation when the requisitions were personally made, were experimented.

This thesis concerns with the method for measuring the bandwidth, frequency stability, per cent modulation, and spurious emission of the radio broadcast transmitter which are important for checking the transmitter which cause the interferences.