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**EFFECT OF EXCITATION CONTROL ON IMPROVING THE SUBSYNCHRONOUS
RESONANCE STABILITY BOUNDARIES**

BY

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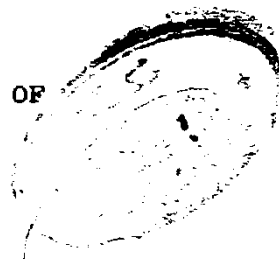
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STATEMENT

This dissertation is submitted to Ain Shams University for the degree of Master in Electrical Engineering .

The work included in this thesis was carried out by the author in the Department of Electrical Power and Machines , Ain Shams University , from October 1986 to June 1990 .

No part of this thesis has been submitted for a degree or a qualification at other University or institution .

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"EFFECT OF EXCITATION CONTROL ON IMPROVING THE SUBSYNCHRONOUS
RESONANCE STABILITY BOUNDARIES "

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ABSTRACT

The subsynchronous resonance (S.S.R) phenomenon in series compensated power systems has been the focus of considerable interest over the last two decades . This phenomenon refers to the excessive shaft torque pulsations resulting from an interaction between the electromagnetic and the electromechanical system oscillations at specific frequencies .

In this thesis, the physical nature of the S.S.R phenomenon, the factors affecting its presence as well as the available methods of its handling are discussed. A supplementary excitation controller using properly chosen signals is proposed as a possible method for avoiding the serious consequences of this phenomenon .

For this purpose , the mathematical models and the corresponding digital computer simulations needed for performing the aimed at investigations are developed . These are based on a linearized version of the system equations . In addition , analytical investigations are carried out in order to realize the limitations imposed on the different techniques of supplementary excitation control .

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