بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
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MONA MAGHRABY

Cairo University

NUMERICAL INVESTIGATION ON AIR FLOW CHARACTERISTICS INSIDE A TELECOMMUNICATION SHELTER ROOM

By

Emad Abdelsamad Abdelhamid Abdelrazek

A Thesis submitted to the
Faculty of Engineering, Cairo University
In Partial Fulfillment of the Requirements for the Degree of
MASTER OF SCIENCE
in
MECHANICAL POWER ENGINEERING

FACULTY OF ENGINERING, CAIRO UNIVERISTY
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Title of Thesis: Numerical investigation on air flow characteristics inside a telecommunication shelter room.

Key Words: Numerical investigation; Air flow characteristics; Telecommunication shelter; Computational fluid dynamics (CFD); Thermal performance.

Summary:

The main point of this thesis is to investigate the thermal performance and air flow characteristics inside a telecommunication shelter by changing the place of computer room air conditioning (CRAC) to get optimum air distribution. The study is carried out using computational fluid dynamics (CFD) simulation using a commercial CFD code ANSYS 17.

The investigation conducted for four cases, first and second cases represent the change of CRAC place and their effect on air flow distribution, third and fourth case represent the separation between inlet and outlet flows of battery cabinet and their effect on thermal performance.

It's observed from the results that the temperature of supplied cooled air to main components decreases by percentages of 23.5%, 7.6%, 23.6% and 35.3% for different devices due to air flow distribution enhancement. Finally, it's observed that the best performance for air distribution inside the shelter is obtained from fourth case.

Disclaimer

I hereby declare that this thesis is my own original work and that no part of it has been submitted for a degree qualification at any other university or institute.

I further declare that I have appropriately acknowledged all sources used and have cited them in the references section.

Name: Emad Abdelsamad Abdelhamid Abdelrazek Date: / / 2021

Signature:

Dedication

I dedicate this thesis to the soul of my beloved father (may god bless him) who was the source of my persistence.

Acknowledgments

In the beginning, I am grateful to God for the good health and well-being that are necessary to complete this thesis. I am also using this opportunity to express my gratitude to everyone who supported me throughout the study. I am thankful for their aspiring guidance, invaluably constructive criticism and friendly advice during the work. I am sincerely grateful to them for sharing their truthful and illuminating views on a number of issues related to this thesis.

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