AUTOMATED DEMAND RESPONSE FOR A COMMERCIAL BUILDING: A MODEL DESIGN AND PILOT STUDY

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(159303B)

Degree of Master of Science in Electrical Engineering

Department of Electrical Engineering

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DECLARATION OF THE CANDIDATE & SUPERVISOR

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Dr. P.S.N. De Silva

Signature of the supervisor: Date

Dr. W.D.A.S. Rodrigo

ABSTRACT

The inherent intermittency of non-conventional renewable resources has been the major impediment in admitting renewable resources to the traditional Electricity Grid. The flexibility of loads in the power system are disregarded in such analysis. The traditional Utility and Customer model is now subjected to change with active customer participation from demand side.

With the growing renewable share in the Energy mix, power industry will require more capacity and inertia to have a better control over the power quality. Automated Demand Response is the cutting edge technology which enables the grid to use load flexibility in counteracting the NCRE intermittency.

This project pilots the possibility of mitigating the rooftop solar intermittency of a building with air conditioning loads which has an inherent flexibility as DR resources. A building-wide Home Area Network is implemented together with short term solar prediction and a central controller with dynamic dispatch algorithm.

Results from the pilot project are presented to demonstrate as how the solar transients are mitigated at the Point of Common Coupling (PCC) with an eye on benefits and impacts on the participants.

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