EVALUATION OF CATASTROPHIC INDICATOR FOR POWER SYSTEM STABILITY ASSESSMENT

A Progress Report submitted in partial fulfilment

of the requirements for the degree of

Master of Technology

in

Electrical Engineering

(Specialization in POWER SYSTEM ENGINEERING)

by

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CERTIFICATE

This is to certify that the work contained in the Project Work entitled **"EVALUATION OF CATASTROPHIC INDICATOR FOR POWER SYSTEM STABILITY ASSESSMENT"**, submitted by **Subha Biswal** (Regd. No.: 1704050016) for the award of the degree of master of Technology in Electrical Engineering during the Academic Year 2021-2022 to the **Veer Surendra Sai University of Technology, Burla**, is a record of bonafide research work carried out by him under my direct supervision and guidance.

I considered that the project work which is modified as per the suggestions of the examiners has reached all prescribed requirements of the rules and regulations relating to the nature of the degree. The contents incorporated have not been submitted elsewhere for the award of any other degree.

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CERTIFICATE OF APPROVAL*

This is to certify that we have examined the dissertation entitled **“EVALUATION OF CATASTROPHIC INDICATOR FOR POWER SYSTEM STABILITY ASSESSMENT"**, submitted by **Subha Biswal** (Regd. No.: 1704050016) in partial fulfillment for the degree of **Master of Technology** with specialization in **Power System Engineering** at the Department of Electrical Engineering of **Veer Surendra Sai University of Technology, Burla, Odisha.**

We hereby accord our approval of it as a dissertation work carried out and presented in a manner required for its acceptance for the partial fulfillment for the award of degree of Master of Technology in Electrical Engineering with specialization in Power System Engineering for which it has been submitted. The approval does not necessarily endorse or accept every statement made, opinion expressed or conclusions drawn as recorded in this thesis. It only signifies the acceptance of the thesis for the purpose it has been submitted.

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I certify that:

- The work contained in the thesis is original and has been done by myself under the supervision of my supervisor.
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ABSTRACT

Though broad work is accounted for on different catastrophic indicators for the appraisal of power system stability, the relative evaluation has not gotten a lot of consideration by the analysts. With the approach of wide area management system (WAMS) innovation and close to real-time instruments accessible, these indicators can assume a significant part in operation and control of the framework. Indicator's choice depends on various performance deciding factors like accuracy, security, mis-detection, reliability and false-alarm), which utilize a typical stage for assessment. The methodology begins by producing a contingency dataset of an organization, trailed by acquiring the organization estimations to the contingency dataset. These estimations are utilized as a contribution to the indicators for recognizing stability or instability cases. The performance measures are processed to every indicator for their appraisal. Notwithstanding the above performance measures, strength and affectability are acquired to every pointer. Ongoing work has reached till getting curves for the variety of generator angles regarding the system COI. Additionally, IEEE 10 bus 4 generator system and IEEE 145 bus 50 bus generator are used for observing the procedure.

Keywords:

Contents

List of Figures

List of Tables

Some Important Abbreviations

AHP	Analytical Hierarchy Process
ACM	Approved Consolidated Methodology (CDM)
AMS	Approved Methodology for Small scale projects
Beta-PD	Beta probability distribution
BAU	Business-as-usual
CA	Cost Additionality
CCV	Coefficient of variation of cost
CDF	Cumulative Distribution Function
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CF	Capacity Factor
CO	Compromise solution
CS	Cost Savings
DFIG	Doubly Fed Induction Generator
EA	Emission Additionality
ECV	Coefficient of variation of emission
ED	Economic Dispatch
EED	Economic Emission Despatch
ER	Emission Reduction
EF	Emission Factor
FACTS	Flexible AC Transmission System
GOF	Goodness-of-fit test
GSC	Grid side converter

JM	Justus and Mikhail
IC	Installed Capacity
IPM	Interior Point Method
MC	Minimum Cost solution
MCDA	multi-criteria decision analysis
MCS	Monte Carlo Simulation
ME	Minimum Emission solution
MO	Multi-objective solution
PD	Probability Distribution
PDF	Probability Distribution Function
PLA	Real Power Loss Additionality
PLCV	Coefficient of variation of P_{loss}
PEM	Point Estimate Method
QLA	Reactive Power Loss Additionality
QLCV	Coefficient of variation of Q_{loss}
RES	Renewable Energy Sources
RSC	Rotor side converter
RV	Random variable
SD	Standard deviation
TG	Thermal generator
TPP	Thermal Power Plant
VWS	VSSUT weather station
VPL	Valve point loading
W-PD	Weibull probability distribution
WES	Wind energy share
WG	wind generator
WRA	Wind Resource Assessment
WSC	Wind Shear Coefficient
WSF	Wind Speed Forecasting
WTPC	Wind Turbine Power Curve

Chapter 1

Introduction

1.1 Introduction

1.2 Project Motivation

ion V enumerates the conclusions drawn from this work.

1.3 Literature Review

1.4 Objective of the Work

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1.5 Thesis Organisation

Chapter 2 Explains the basics of

Chapter 3 Tells about the

Chapter 4 Deals with the results of

Chapter 5 Highlighted the conclusion based on project and future scope based on present thesis.

Chapter 2

Problem Formulation

2.1 General Terminologies used for Stability Assessment

2.2 Catastrophic Indicators

Chapter 3

Software Description

3.1 Introduction

3.2 MAT-POWER Tool Box

3.2.1 Economic Load Dispatch Example on IEEE-9 Bus System

3.3 MAT-TRANS Software

Chapter 4

Probabilistic optimal power flow with wind uncertainty

4.1 Introduction

4.2 Discussion

Chapter 5

Evaluation of Additionality of wind power after integration

5.1 Introduction

5.2 Discussion

Chapter 6

A composite index for wind integrated power systems

6.1 Introduction

6.2 Discussion

Chapter 7

Conclusions and future scope

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