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4th IEEE International Conference On Emerging Smart Computing andInformatics (ESCI-2022)

Virtual Conference

9th, 10th & 11th March 2022

BOOK OF ABSTRACT

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ESCI 2022 Programme Schedule

Keynote Talk -3 Time: 12.00 PM – 1.00 PM Speaker: Dr. Mohamed Elhoseny College of Computer Information Technology, Dubai UAE Topic: Smart Sensor Technologies and Applications	I Link: https://tinyurl.com/2p8w57rc I Event number:2517 221 7563 I Event password: ioit123 I Coordinator: Mrs. S. N. Powniker

LUNCH BREAK 1.00 PM-2.00PM

Keynote Talk -4 Time: 2.00PM – 3.00 PM Speaker: Chyi-Yeu Lin Distinguished Professor (Director of Center for Intelligent Robots) Ph.D., University of Florida, U.S.A. Topic: Design Mechanics & AI & Robots	I Link: https://tinyurl.com/2p8w57rc I Event number:2517 221 7563 I Event password : ioit123 I Coordinator : Mr. P. P. Mahajan M: 9763644533

Special Session 1

Session Coordinator: Mr. Shailesh Gawai : 8855078124 | Ms. Sandhya Ahire : 9975152810 I Mr. Mohsin Aftab Mulla
Link: https://tinyurl.com/2s38abts |Event number: 2515 815 8703 | Event password: esci2022|Time : 3.00 PM -5.00 PM

Sl. No.	Paper ID	Title
1	VK_01	A Fuzzy Statistical Perspective for Empirical Evaluation of EEG Classification Models for Epileptic Seizures
2	VK_03	An Empirical Investigation Of Dynamics Of Institutional Investors' Trading Behaviour And Stock Market Returns In India During COVID-19 Period
3	VK_08	Non-Polynomial Spline Technique For Numerical Simulation Of Singularly Perturbed Boundary Value Problem With Two Parameters And Its Application In Mechanics
4	VK_13	Enhancing the Convergence Speed and Accuracy of Particle Swarm Optimizers through Adaptive Learning
5	VK_20	A Game Theory Model for Optimization of the OTT Platform Strategies
6	VK_26	An Analytical Perspective for Diabetic Retinopathy Using Convolutional Neural Network
7	VK_34	Integration of CQCC and MFCC based Features for Replay Attack Detection

Technical Oral Presentation Session 7: Smart Computing

Session Coordinator: Mrs. Chitralekha Rananaware : 9284165920 I Mr. Sugar Pawar 8087685979 I Mr. Sachin A Kupade
Link: https://tinyurl.com/2p89wh95 | Event number: 2511 177 1093|Event password: esci2022 |Time : 3.00 PM -5.00 PM

Sl. No.	Paper ID	Title
1	347	IMPLEMENTATION - Surplus resources to Private Cloud
2	239	Line Loss Reduction with Optimal Placement of DGs by using Contingency Analysis of 5 bus system
3	272	Day Ahead Hybrid Forecasting of Global Horizontal Irradiance using Machine Learning (Random Forest Algorithm) and Time-Series Model (SARIMAX)
4	45	Design of Multipliers Using Reversible Logic and TOFFOLI Gates
5	57	Tri-Plant Leaf Disease for Bell Paper, Tomato and Potato Classification Using CNN

2022 International Conference on Emerging Smart Computing and Informatics (ESCI)
AISSMS Institute of Information Technology, Pune, India. Mar 9-11, 2022

Line Loss Reduction with Optimal Placement of DGs by using Contingency Analysis of 5 bus system

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Abstract. **The implementation of Distributed Generations (DGs) is increasing these days, and they are being utilized in distribution networks with the primary objective of improving system dependability. Also, any operational engineer may defend a power system, which is usually done through online security analysis, i.e. contingency analysis (CA). CA is a tool for analyzing the consequences of various outages like transformer, transmission lines, and other component failing. The Newton Raphson load flow method is used which is the finest load flow technique because it delivers correct results in less time, was used in this study to compute 5-bus system responses. Active power indices and voltage performance indices for single line outage on a five-bus system. Contingency Ranking has been done based on values of overall performance indices. Impact on bus voltage and active power flow has been analyzed before and after single line outages of most severe line contingency. Optimal placement of DGs has been done on ranked bus and line loss reduction has been evaluated. In MATLAB, the method's efficacy was evaluated on the IEEE-5 Bus system. This CA will be helpful to operating engineer for knowing which transmission line outage is severe to take the appropriate action which is risky in the system and with this earlier action can be taken to curtail the cause of breakdown of that specific line.**

Keywords: Performance Indices, Distributed Generations, Contingency Analysis,

I. INTRODUCTION

Contingency, which really specifies the failure of one or more equipments of the power system for a short period of time if undesirable events occur in the power system, is nothing but Contingency. CA depicts the position of the power system in the event of a failure of any device or line in the power system. CA is an online application that is used to manage power systems that have problems with voltage and power flow. Using a contingency ranking technique, these situations are examined and rated in order of severity[1].

CA is usually categorized in three sections: Contingency Creation, Selection, and Evaluation [2], even though the selection and evaluation are done in the similar section now days. Several studies were performed on Contingency selection, with the goal of reducing the existing vast list of contingencies by focusing on outages that cause significant limit breaches. The two main methods for seasoning this selection are contingency grading and contingency sorting. The contingency sorting methods are based on a generalized study that selects the tremendous critical cases for a meticulous an investigation, while non-critical cases are eliminated from the contingency list. The performance index used as a scaler number described the impact of an failure over the entire system while the grading approach [4]. In developing power systems, distributed generation (DG) is projected to play a larger role [7]. According to studies, DG will account for a large portion of all next generation internet users. DG can make use of a variety of resources. Its influence on distribution networks can be beneficial or negative, depending on the working condition of the system [7-9], Features of the DGs, and the location. Enhanced system dependability, loss reduction, and improved power quality and voltage profile are all possible benefits.

The contingency list is created at the outset, and it comprises those instances with a high likelihood of experiencing an outage. The long list refers to electrical network outages, most of which are caused by generator and/or line failures. Following that, with the help of load flow a contingency evaluation has done on the subsequent individual failure by descending order of severity. This process will be continued until there are no further post-contingency infractions. The DGs are placed on a ranking line, and losses are computed.

II. CONTINGENCY ANALYSIS

A. Contingency Creation

This is the first phase in the contingency analysis process. It is made up of every possible contingency that might occur in a power system. Making contingency lists is part of this procedure.

B. Contingency Selection:

The process of detecting significant contingencies from anything that might cause active power and voltages of lines to be violated is the next phase of the CA process. The contingency list is reduced in this method by rejecting the least severe contingency and considering the most severe contingencies. The performance index was utilized to identify the dangerous one during this procedure.

C. Contingency Evaluation

This third phase is very important because it is having the critical control and safety operations that help a power system to avoid the impact of the dangerous event [3].

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16 – 18 November 2021
National Institute of Technology Silchar

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3. All the technical session coordinators are requested to check the facilities and connections prior to the commencement of the sessions.
4. The sessions are distributed in offline and online sessions. Offline session means the paper presenters will be present offline and panelist may be present online and offline. Online session means the paper presenters will be in online mode but the panelist may be offline and online mode. Please refer in the session distribution for the information on the panelist for offline or online. The panelist who will be online, it is mentioned against their name as online.
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		Day 2		
2	Harnessing economic potential of eco services, herbal tourism, cultural tourism & ethnic tourism	**Paper ID** **4, 16, 122, 126, 149, 163, 192, E3, E10, E18, E29** **Panelist** Dr. Rashmi Verma, Former Secretary, Ministry of Tourism (Online) M. Z. I. Dalton Zahir, Director, Tourism Developers Association of Bangladesh (Online) **Coordinator** Dr. S. Bera (+91 8018123682)	**Hall 303** **Session 6** https://negreensummit2021.wildslug.in	**17.11.2021** **10:00 AM**
3	Energy and habitats for future	**Paper ID** **18, 25, 32, 55, 60, 76, 80, 84, 91, 92, 199, 141, 142** **Key Note Address** Prof. K. Mohanty, IIT Guwahati (Online) **Session Chair** Prof. B. K. Roy, NIT Silchar **Rapporteurs** Dr. S. Sreejith, NIT Silchar (+91 9790636602)	**Hall 305** **Session 7** https://negreensummit2021.wildslug.in	**17.11.2021** **10:00 AM**
		Paper ID **128, 131, 166, 173, 174, 182, 202, 143, 150, 161, E9, E14, E16** **Keynote Address** Dr. D. Dutta, Head, SEED, DST (Online) Dr. Zakir Rather, IIT Bombay (Online) **Session Chair** Dr. S. Kumar, NIT Trichy (Online) **Coordinator** Dr. S. Mansani, NIT Silchar, (+91 6022643647)	**Hall 306** **Session 8** https://negreensummit2021.wildslug.in	**17.11.2021** **10:00 AM**
4	Sustainable technologies for post COVID world	**Paper ID** **27, 33, 61, 78, 125, 137, 146, 147, 148, 153, 170, 188** **Session Chair** Pro. U. Kumar, NIT Silchar **Rapporteurs** Dr. V. Kulkarni, NIT Silchar (+91 88221 80593)	**Hall 307** **Session 9** https://negreensummit2021.wildslug.in	**17.11.2021** **10:00 AM**

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S. No.	Paper ID	Authors	Title
76	163	Parinita Borgohain	Economic potential of Dibrugarh, Assam as an eco, cultural and ethnic tourism hub: A future perspective on entrepreneurship
77	165	Nirmala A.P.	Performance analysis of machine learning algorithms to diagnose Breast Cancer
78	166	Hemen Medhi	A Process to Harvest Electrical Energy from Living Plants
79	167	Jincy Mathew	PREDICTION OF SPINAL ABNORMALITIES USING MACHINE LEARNING
80	170	Debopriya Kar and Binoti Patro	The impact of Covid-19 pandemic on the factors affecting the green banking solutions.
81	173	Motepelli Siva Rama Ganesh and S Sasikumar Dr	Design and Development of Solar based Electric vehicle – a Prototype
82	174	Lakshman Kumar Dangeti, Dr Amritesh Kumar and Ganesh Chilakapudi	INTEGRATION OF TWO DIFFERENT MODULES TO FORM A NON-ISOLATED MULTI-PORT CONVERTER
83	175	Anand Kumar Singh and Binoti Patro	Role of entrepreneurs through innovation in building nation after the new normal
84	177	Madhwaraj Gopal	Machine learning techniques in Agriculture - A case study
85	179	B Nithya Ramesh	Artificial Emotional Intelligence in Healthcare by Harnessing Data Analytics and Machine Learning Techniques
86	180	Rajeev Das and Kedar Nath Das	Fixed Charge Transportation Problem: A critical review
87	181	Ambika Kuity and Avrataru Roy	Effect of reclaimed asphalt pavement material on skid resistance for open graded friction course mixture
88	182	Lakshman Kumar Dangeti, Mahendra Chand Bade and Amritesh Kumar	ANALYSIS AND REDUCTION OF HARMONICS IN THE CASCADED MULTILEVEL INVERTER FOR VARIOUS LEVELS USING PHASE-SHIFTING TECHNIQUE
89	183	Aparna Deka and Nripendra Kumar Choudhury	TRADITIONAL KNOWLEDGE AND SUSTAINABLE USE OF LOCALLY AVAILABLE MEDICINAL PLANTS BY THE PEOPLE OF ASSAM
90	184	Ambika Kuity and Sayantan Sasmal	Effect of waste materials as filler on performance of mastic and asphalt mix
91	187	Ramanamma Parepalli	LAKE WATER BLOOM INTELLIGENT PREDICTION METHOD AND WATER QUALITY REMOTE MONITORING SYSTEM
92	188	Prerona Roy and Md. Ahmaruzzaman	Utilization of fly ash for decontamination of water from heavy metals and inorganic ions
93	189	Akshay Kumar Dey and Md. Ahmaruzzaman	Advances in eco-friendly and sustainable environmental remediation using Bio-adsorbents
94	190	Mathangi Lekhana Sri and Dr.Asha Rani M A	Review of Electric Machines for Electric Vehicle Operation
95	191	Dr Senthil Kumar R, Dr. Dinesh G and Dr.Anidha Arulanandham	Machine learning model based future ambient air quality index (AQI) analysis on the cardinal directions of Bengaluru City
96	192	Dr. B. Meenakshi Sundaram, Dr. Rajalakshmi B, Shanmuga Priya Soundararajan and Dr.V. Asha	ASSESSMENT FOR IOT BASED BIOECONOMY FOR RISE IN GDP
97	195	Emmanvel Raj Chirchi, Devi Naveen and Nikita Rane	Authentication system for Biometric Iris pattern Recognition using Innovative Segmentation and Feature extraction method for person identification
98	198	Bangari Sindhuja, Surya Pandey, Nikita Rane and Sasikala N	A Survey on Smart contracts in Business Process Management
99	199	Manoj Kumar Kumawat and Dr. Samuel Lalthazuala Rokhum	A REVIEW ON BIODIESEL PRODUCTION USING BIO-MASS DERIVED CALCIUM OXIDE
100	202	Swati Warungase and Dr. Mangalkumar Bhatkar	Line Loss Reduction with Optimal Placement of DGs by using Contingency Analysis of 5 bus system

LINE LOSS REDUCTION WITH OPTIMAL PLACEMENT OF DGS BY USING CONTINGENCY ANALYSIS OF 5 BUS SYSTEM

Ms. Swati K. Warungase[1] and Dr. M.V. Bhatkar[2]

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ABSTRACT.

The implementation of Distributed Generations (DGs) is increasing these days, and they are being utilized in distribution networks with the primary objective of improving system dependability. Also, any operational engineer may defend a power system, which is usually done through online security analysis, i.e. contingency analysis (CA). CA is a tool for analyzing the consequences of various outages like transformer, transmission lines, and other component failing. The Newton Raphson load flow method is used which is the finest load flow technique because it delivers correct results in less time, was used in this study to compute 5-bus system responses. Active power indices and voltage performance indices for single line outage on a five-bus system. Contingency Ranking has been done based on values of overall performance indices. Impact on bus voltage and active power flow has been analyzed before and after single line outages of most severe line contingency. Optimal placement of DGs has been done on ranked bus and line loss reduction has been evaluated. In MATLAB, the method's efficacy was evaluated on the IEEE-5 Bus system. This CA will be helpful to operating engineer for knowing which transmission line outage is severe to take the appropriate action which is risky in the system and with this earlier action can be taken to curtail the cause of breakdown of that specific line.

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ICEMELTS'18

3rd to 5th December 2018

Certificate

Certified that Mr./Ms ***Sachin L. Desale*** of ***Sandip University, Nashik*** has presented a paper on topic ***Analysis and Design of Jet Blast Fence For Commercial and Military Aircrafts Using ANSYS*** in the International Conference on Emerging Trends in Management, Engineering, Law, Technology and Science (ICEMELTS'18) organised by Sandip University, Nashik, during 3rd to 5th December 2018.

Prof. Chetan Choudhary
Conference Secretary

Prof. Rosilda Selvin
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Convener

ICEMELTS 2018

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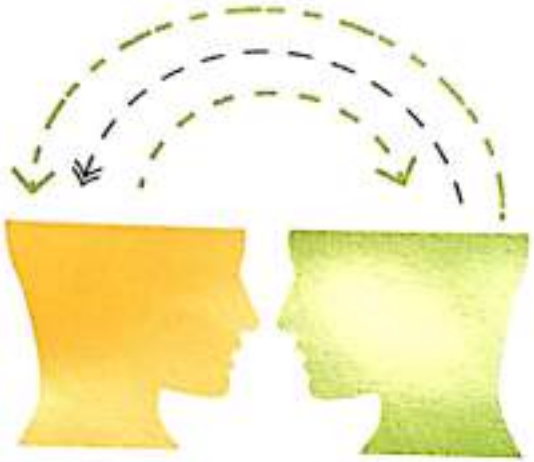

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ICEMELTS CONFERENCE 2018

PREFACE

This Souvenir is brought out to mark the International Conference on "Emerging Trends in Management, Engineering, Law, Technology and Science" (ICEMELTS'18) during 3rd to 5thDecember, 2018 Organized by Sandip University, Nashik.

The International Conference ICEMELTS'18 provides an ideal platform to new researchers to share their views and experiences, in the field of Management, Science, Engineering, Technology and Law. This conference will facilitate exchange of new perception; will build a dialogue between academic innovators, researchers, technologists, sociologists, lawyers, industrialists and pedagogues that will enable discussions on most recent innovations, challenges and solutions in the domain of emerging trends.

We wish to thank all the foreign delegates, Scientists, panelists and Researchers for their contributions to plenary speeches, keynote lecturesand paper/poster presentations. A special thanks to all the guidance and support given by the Vice- Chancellor and Dean(s), HODs, Faculties Sandip University. We are highly indebted to the National and International advisory board,ICEMELTS'18 Organizing committee for providing valuable guidance in organizing this mega event.ICEMELTS'18 is grateful to all the sponsors, who have offered financial assistance for this conference. We are very thankful to all staff and student volunteers for contributing towards the successful execution of ICEMELTS'18.

The overwhelming responsereceived from Scientists and Researchers around the world to this ICEMELTS'18 is highly appreciated.

Prof. Rosilda Selvin, **Dean (Research)**
Prof. Arun Kumar Dwivedi, **Dean (Academics)**

CONVENERS, ICEMELTS-2018

ICEMELTS CONFERENCE 2018

60	060-ET-CE052	Analysis of Steel and RCC Chimney Using Software	Abhishek L.Shimpi and R. S. Talikoti
61	061-ET-CE053	Analysis and Design of Jet Blast Fence For Commercial and Military Aircrafts Using ANSYS	Sachin L. Desale and R. S. Talikoti
62	062-ET-CE054	Effective Retrofitting Techniques for Unreinforced Structures – A review	Shubham Kolhe, Mahesh Endait and Suyash Wagh
63	063-ET-CE055	Progressive collapse of RCC frame structure	Harshal P. Shahane and R. S. Talikoti
64	064-ET-CE056	Comparative Study of Analysis and Design of Pre-Engineering Building with Conventional Steel Building	Shubham D. Kothawade and R. S. Talikoti
65	065-ET-CE057	Design of G+7 hostel building to carry Dynamic load (seismic & wind)	Stella V. Pinto and Sachin B. Mulay
66	066-ET-CE058	Moment-Rotation Relationship for Semi-Rigid Connection: Review	Nachiket P. Moharir and Sachin B. Mulay
67	067-ET-CE059	Analysis and design of tensegrity dome structure	Kunal Sonawane and Sachin B. Mulay
68	068-ET-CE060	Analysis and design of dome structure	Kiran P. Khandare and Sachin B. Mulay
69	069-ET-CE061	Review of various techniques and methods used to investigate uses of belt truss and outrigger system in a tall building	Nimish Patrekar and Sachin B. Mulay
70	070-ET-CE062	A review on structural performance of diagrid structural system on high rise building.	Kunal Vadnere and Sachin B. Mulay
71	071-ET-CE063	Analysis of RCC structure with viscous damper under seismic loading	Pranav Bramhankar and Sachin B. Mulay
72	072-ET-CE064	Voided Slab System	Anish Shah and Sachin B. Mulay
73	073-ET-CE065	Dynamic Analysis of Elevated Water Tanks	Dhondge Damini and R. S. Talikoti

061-ET-CE053

Analysis and Design of Jet Blast Fence For Commercial and Military Aircrafts Using ANSYS

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ABSTRACT

A jet blast produces tremendous amount of thermal energy and noise. In order to prevent mishaps or equipment failure of machines nearby blast fences are used. A blast fence is often called as a "blast deflector" by the layman. A blast fence or a jet blast deflector (JBD) is a safety device which redirects the high energy from a jet engine to prevent accidents/damages. These structures must be strong enough to withstand the high speed jet exhaust and wind loads. This paper discusses the analysis and design approach implemented in the design of a Jet Blast Deflector system installed in one of the largest Base Repair Depots (BRD) Air Force Station in the nation. The Jet Blast Deflector is installed in the Base Repair Depots in order to do ground run after maintenance of the Russian fixed-winged aircrafts and as such, the Sukhoi-30s are brought for their overhaul wherein every single part of the aircraft is dismantled, repaired, replaced and then reassembled. The configuration of the system will develop to satisfy, among other requirements, the frangibility criteria of the Indian Air Force guidelines. Computational Fluid Dynamics (CFD) and finite element simulations will undertake to optimize the design of the Jet Blast Deflector. The main goal of the optimization process was to minimize air speeds and ensure frangibility of the proposed design. In the present paper an attempt has been made to focus on design criteria, selection of structural members for analysis of jet blast deflector fence using ANSYS softw are. It is designed to provide a simple and aesthetically pleasing appearance. Blast deflector provides positive protection for ground vehicle, pedestrians and other airport facilities that may be subjected to jet-blast hazards from nearby runways. At airports blast fences are complementarily used with sound-deadening walls with which a jet/aircraft can be tested silently and safely. Without blast fence, the high intensity jet blast can be dangerous to people or other machines near the aircraft.

Keywords: Jet Blast Fence, Military Aircrafts, ANSYS.

062-ET-CE054

Effective Retrofitting Techniques for Unreinforced Structures – A review

Shubham Kolhe*, Mahesh Endait,Suyash Wagh
School of Engineering & Technology, Sandip University, Nashik.
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ABSTRACT

Construction strategies of structures in historical developments generally included unreinforced masonry (URM) techniques, due to easy construction methodology and availability of construction material. Low tensile capabilities of such constructions have a higher risk coefficient subjected to loads in out of plane directions i.e. due to seismic activities or heavy impacts due to manmade activities or wind forces, this property of URM promotes researchers to come out with different techniques to impart tensile and strength capabilities to such structures. Work herein reviews different retrofitting techniques available, field applications of such techniques and need for further development in the field of retrofitting to reduce risk and to notify intimations prior to collapse of the structures. Brief summary of different experiments carried to prove the applicability of suggested techniques is simultaneously included. Drawbacks of few techniques due to either increased dead weight or high construction cost are brought in views in this review. Major focus of the work is to come out with cost effective technique, easily available retrofitting materials and easy application procedures. Study concludes with improvements needed in techniques and comparison of different techniques on basis of applicability. This work can prove a guideline to researchers to come out with improved techniques and also to Engineers while selecting method for field application of retrofitting of unreinforced structures.

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Modelling and Simulation of Three-Phase Induction Motor to Diagnose the Performance on Inter-Turn Short Circuit Fault in Stator Winding

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***Abstract*—In this paper, the mathematical model of Three Phase Induction Motor is studied and from this the model for the Inter-Turn short fault in stator winding is derived. First the model is derived for the balanced conditions and then it is for unbalanced conditions by shorting the stator turns one phase. The performance on both the conditions is presented. The stator winding inter turn short circuit fault is most common source of breakdowns in induction motors. The early detection of inter-turn short circuit fault during motor operation would eliminate some subsequent damage to adjust coils and stator core, reducing the maintenance costs. In present paper the performance on balanced supply condition and inter-turn short circuit conditions by MATLAB simulation is discussed.**

***Index Terms*—Induction motor, inter-turn faults, diagnosis, balanced and unbalanced conditions.**

I. Introduction

As Induction motors are very simple, robust in constructions, strong durability, easy maintenance, low manufacturing cost and easy to transform electrical power into mechanical power through the air gap as there is no electrical connection between stator and the rotor. So Induction motors are widely used in all industrial processes and thus problems of their maintenance and fault detection become more and more important. The failure of the motor can cause substantial revenue losses and even damages of the whole drive system. As per literature review the induction motor faults are: Stator Related Faults: 38%, Rotor Related Faults: 10%, Bearing Related Faults: 40%, other Faults: 12%. So the stator related faults is one of the major fault in Induction Motor. Sometimes undetected stator inter-turn fault progresses and breakdown occurs [1] [2]. Stator winding faults coused by weak insulation due to combination of electromechanical , vibration, thermal over load etc. If the turns of stator are shorted a large circulting current induced in shorted turn soo the thermal overloading [3] [4]. The modelling of induction motors is done at steady state and transient conditions. The stator turns are shorted for the detection of stator inter-turn faults. The MATLAB simulation is carried out on symmetrical, balanced and asymmetrical induction motor. The generally the researchers are applying the generalised theory of electrical machines to detect the various faults in electrical machines. In the present work the Parks dq0 transformation is used for simulation purpose. The simulation results on healthy motor and with shorted stator turns are presented in the paper [5] [6].

II. The Mathematical Model of 3 ph SCIM:

The 3 ph SCIM mathematical model for various stator turns short circuited is presented below. The machine is assumed to have uniform air gap and no magnetic saturation in the magnetic circuit. The magnetically coupled stator and rotor, the stator voltage equations:

$$v_{as} = r_s i_{as} + d\lambda_{as}/dt \quad (1)$$

$$v_{as} = r_s i_{as} + p\lambda_{as} \quad (2)$$

$$v_{bs} = r_s i_{bs} + p\lambda_{bs} \quad (3)$$

$$v_{cs} = r_s i_{cs} + p\lambda_{cs} \quad (4)$$

$$r_{as} = r_{bs} = r_{cs} = r_s \quad (5)$$

The rotor voltage equations:

$$v_{ar} = r_r i_{ar} + d\lambda_{ar}/dt \quad (6)$$

$$v_{ar} = r_r i_{ar} + p\lambda_{ar} \quad (7)$$

$$v_{br} = r_r i_{br} + p\lambda_{br} \quad (8)$$

$$v_{cr} = r_r i_{cr} + p\lambda_{cr} \quad (9)$$

$$r_{ar} = r_{br} = r_{cr} = r_r$$

and

$$v_{ar} = v_{br} = v_{cr} = 0$$

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Performance of Three Phase Induction Motor on Voltage Unbalance and Stator Inter-Turn Short Circuit Fault

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Abstract— The induction motor operate satisfactory on balanced normal conditions. It is low operating and maintenance cost and energy efficient electro-mechanical drive. It is used in all industrial processes as there is no alternative to induction motor in industry. During operation, various stresses are developed in induction motor which may cause failure of motor. So, there is wastage of time and revenue loss. There is continuous variation in supply system due to small unbalance in distribution system. Due to some reasons, if the voltage unbalance exceed the 3 % then it will be harmful for induction motors. It is essential to diagnose the performance of motor on unbalanced supply conditions and stator inter turn short circuit fault. In this paper induction motor model is derived for symmetrical and asymmetrical conditions to diagnose the performance at unbalanced supply voltage and stator inter turn short circuit fault.

Keywords— Induction motor, inter-turn faults, diagnosis, balanced and unbalanced conditions.

I .Introduction

The induction motors are very simple, robust in constructions, strong durability, easy for maintenance, low manufacturing cost and easy to transform electrical power into mechanical power through the air gap. There is no electrical connection between stator and the rotor so the failure rate as compared to other electromechanical drives is less and also it is efficient. So Induction motors are widely used in all industrial processes and thus problems of their maintenance and fault detection become more and more important. The failure of the motor can cause substantial revenue losses and even damages of the whole drive system. As per literature review the induction motor faults are: Stator Related Faults: 38%, Rotor Related Faults: 10%, Bearing Related Faults: 40%, other Faults: 12%. So the stator related faults is one of the major fault in Induction Motor. Sometimes undetected stator inter-turn fault progresses and breakdown occurs. [1],[2] Stator winding turn faults, are caused by gradual deterioration of turn insulation due to a combination of electromechanical force induced, vibrations, high dv/dt voltage surges, thermal overload, and/or contamination. If the turns of the stator are shorted, a large circulating fault current is induced in the shorted turn leading to localized thermal overloading. [3],[4]. The modelling of induction motors is done at steady state and transient conditions. The stator turns are shorted for the detection of stator inter-turn faults. The MATLAB simulation is carried out on symmetrical, balanced and asymmetrical induction motor. The generally the researchers are applying the generalized theory of electrical machines to detect the various faults in electrical machines. In the present work the Park's dq0 transformation is used for simulation purpose. The simulation results on healthy motor and with shorted stator turns are presented in the paper.[6] In industrial plants the lighting loads connected between phase-to-neutral. Proper balancing of single-phase loads among the three phases on both branch circuits and feeders is necessary to keep the load unbalance and the corresponding phase-voltage unbalance within reasonable limits. When unbalanced phase voltages are applied to three-phase motors, the unbalance voltage causes additional negative-sequence currents to circulate in the motor, increasing the heat losses. The most severe condition occurs when one phase is opened and the motor runs on this condition for sufficiently long time, the motor winding may burn. When a motor trips out, the first step in determining the cause is to check the running current after it has been restarted to make sure that the motor is not overloaded. The next step is to measure phase voltages to determine the voltage unbalance. If the phase-voltage unbalance exceeds 2%, the motor will overheated if it is operating close to full load. [7]. Motor voltage unbalance will increase motor losses due to a negative sequence voltage that causes a rotating magnetic field in the opposite direction of motor rotation. A 2% voltage unbalance will increase losses by 8%, a 31/2% unbalance will increase losses by 25%, and a 5% unbalance will increase losses by 50%. Many motors, especially in the high hp ratings, can be seriously damaged by negative-sequence current heating. Therefore, phase unbalance protection is required for all motors where its cost can be justified relative to the cost and importance of the motor. Phase unbalance protection should be provided in all applications where single phasing is a strong possibility due to factors such as the presence of fuses, overhead distribution lines subject to conductor breakage, or disconnect switches [8].

II. THE MATHEMATICAL MODEL OF THREE PHASE SQUIRREL CAGE INDUCTION MOTOR

The three phase squirrel cage induction motor mathematical model for various stator turns short circuited is presented below. The machine is assumed to have uniform air gap and no magnetic saturation in the magnetic circuit.

The magnetically coupled stator and rotor, the stator voltage equations can be written as:

$$v_s^{abc} = r_s^{abc} i_s^{abc} + p\lambda_s^{abc} \quad \text{and}$$

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Effect of Voltage Unbalance and Stator Inter-Turn Short Circuit on the Characteristic of Three Phase Induction Motor

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Abstract: The induction motor operate satisfactory on balanced normal conditions. It is low operating and maintenance cost and energy efficient electro mechanical drive. It is used in all industrial processes as there is no alternative to induction motor in industry. During operation, various stresses are developed in induction motor which may cause failure of motor. So, there is wastage of time and revenue loss. There is variation in supply conditions in distribution system. It is essential to diagnose the performance of motor on unbalanced supply conditions and stator inter turn short circuit fault. In this paper induction motor model is derived for symmetrical and asymmetrical conditions to diagnose the performance at unbalanced supply voltage and stator inter turn short circuit fault.

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I. INTRODUCTION

The induction motors are very simple, robust in constructions, strong durability, easy for maintenance, low manufacturing cost and easy to transform electrical power into mechanical power through the air gap. There is no electrical connection between stator and the rotor so the failure rate as compared to other electromechanical drives is less and also it is efficient. So Induction motors are widely used in all industrial processes and thus problems of their maintenance and fault detection become more and more important. The failure of the motor can cause substantial revenue losses and even damages of the whole drive system. As per literature review the induction motor faults are: Stator Related Faults: 38%, Rotor Related Faults: 10%, Bearing Related Faults: 40%, other Faults: 12%. So the stator related faults is one of the major fault in Induction Motor. Sometimes undetected stator inter-turn fault progresses and breakdown occurs. [1],[2] Stator winding turn faults, are caused by gradual deterioration of turn insulation due to a combination of electromechanical force induced, vibrations, high dv/dt voltage surges, thermal overload, and/or contamination. If the turns of the stator are shorted, a large circulating fault current is induced in the shorted turn leading to localized thermal overloading. [3],[4]. The modelling of induction motors is done at steady state and transient conditions. The stator turns are shorted for the detection of stator inter-turn faults. The MATLAB simulation is carried out on symmetrical, balanced and asymmetrical induction motor. The generally the researchers are applying the generalised theory of electrical machines to detect the various faults in electrical machines. In the present work the Park's dq0 transformation is used for simulation purpose. The simulation results on healthy motor and with shorted stator turns are presented in the paper.[6] In industrial plants the lighting loads connected between phase-to-neutral. Proper balancing of single-phase loads among the three phases on both branch circuits and feeders is necessary to keep the load unbalance and the corresponding phase-voltage unbalance within reasonable limits.When unbalanced phase voltages are applied to three-phase motors, the unbalance voltage causes additional negative-sequence currents to circulate in the motor, increasing the heat losses. The most severe condition occurs when one phase is opened and the motor runs on this condition for sufficiently long time, the motor winding may burn. When a motor trips out, the first step in determining the cause is to check the running current after it has been restarted to make sure that the motor is not overloaded. The next step is to measure phase voltages to determine the voltage unbalance. If the phase-voltage unbalance exceeds 2%, the motor will overheated if it is operating close to full load. [7]. Motor voltage unbalance will increase motor losses due to a negative sequence voltage that causes a rotating magnetic field in the opposite direction of motor rotation. A 2% voltage unbalance will increase losses by 8%, a 3 1/2% unbalance will increase losses by 25%, and a 5% unbalance will increase losses by 50%. Many motors, especially in the high hp ratings, can be seriously damaged by negative-sequence current heating. Therefore, phase unbalance protection is required for all motors where its cost can be justified relative to the cost and importance of the motor. Phase unbalance protection should be provided

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Energy Balance in AC Is-landed Micro-grid by Frequency Bus Signaling Method

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Abstract - *To keep the frequency stable and maintain overall stability of the AC Is-landed micro-grid, power exchange among DGs, ESS, and loads should be balanced. Many innovative control techniques have been proposed and used for enhancing the stability of micro-grid for proper energy balance. In this work, a self-Governing autonomous power control strategy based on Frequency Bus signaling is proposed in order to achieve power management. The main objective of this proposed strategy is to control the state of charge of Battery reservoir limiting the voltage on its terminals by controlling the power generated by the Renewable energy sources. The electrical frequency of the micro-grid is used to inform the power sources and their respective converters the amount of power they need to generate in order to maintain the ESS state of charge below or equal its maximum allowable limit. This method uses only local measurements for power distribution. Main power management function is implemented locally in primary level, while bounded frequency control can be achieved by using additional controller system.*

***Key Words*: Energy Storage Systems (ESS), Renewable Energy Sources (RES), Distributed Generation (DG), Distributed Storage (DS), Pulse Width Modulation Converters.**

1. INTRODUCTION

We are observing extraordinary growth and challenges in power generation, transmission and usage. New technologies include power generation from renewable energy (RE) resources. Renewable energy generation sources often come in the form of tailored distributed generation (DG) systems in grid-connected or standalone configuration [5]. Power electronics plays vital role to achieve this revolutionary technology. Future grid will be number of interconnected micro-grids in which every user is responsible for the generation and storage part of the energy. Hence, micro-grids are major elements to integrate renewable/distributed energy resources as well as distributed energy storage systems.

Now, technocrats have to face a new scenario in which small distributed power generators and dispersed energy storage devices have to be integrated together into the grid. With this idea, whole energy system will be more efficient, intelligent, and wide-distributed. The use of distributed generation (DG) makes no sense without using distributed storage (DS) systems to cope with energy balances. [2]. Technological advancement in power electronics has led to a condition where renewable energy sources can be virtually considered as completely controllable, within the limits imposed by natural phenomenon. Also, it was envisaged that a large-scale integration of new technologies into a smart grid (SG) will be quite critical if it is done independently. Thus, an idea of merging small variable nature sources with energy storage system (ESS) into a singular controllable entity that can work independently or grid-connected brought to a Micro-grid (MG) concept [3].

In an islanded operation of micro-grid having few micro-sources, the local frequency and the voltage control is not straightforward. During is-landing, the power balance between supply and demand does not match. As a result, the frequency and the voltage of the micro-grid will fluctuate, and the system can experience a blackout unless there is an adequate power-balance matching process. The frequency of the micro-grid may change rapidly due to the low inertia present; hence frequency control at local level is one of the main issues in islanded operation. The ESS is based on power electronic device and has a very fast response time. Therefore, a properly designed ESS can allow a system to stabilize by absorbing and injecting instantaneous power. [6]

Extracting all available maximum power from RESs (MPPT) is desirable, but not always appropriate in isolated systems, as it can lead to an unmanageable excess of energy, resulting in possible overcharging of ESS. On the other hand, a battery, an ESS has specific requirements for recharging to obtain optimum life. So, there should be an option to control the units in the system according to their specific features as well [3].

In is-landed micro-grid comprised of the ESS and PV generation, the ESS unit is usually operated as a grid forming unit that regulates ac bus, while the PV systems work as grid feeding units that inject all available power into the system. ESS plays an important role for achieving the goal of power balance and grid frequency support in a safe range of state of charge (SOC). However, this active power regulation strategy will make SOC out of safe control region if imbalance between consumption and generation lasts longer. These situations are referred to as overcharge and over discharge conditions, and it is well known that they may bring permanent damage to the ESS. On the other hand, auto

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CONTENT

Risk Management in Construction Projects

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Abstract: The paper provides a preliminary research to the basics of risk analysis and its implementation in construction industry. Risk and Uncertainty, are terms frequently used and therefore have been explained in detail. Different Risks on Construction project have been considered and the various methods of Analysis that are adopted are discussed. General Internal and External Sources of risk in Construction Projects have been dealt with.

Use of Cranes In Construction Technology

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Abstract : In construction of HRB and Big Project we required a huge amount of capital investment and men power although we have the entire thing with us we are unable to complete project on time because there are no. of factor affecting the delay in construction. The main reason behind this might be improper management and illiteracy about the modern equipments. So by using modern equipments we can achieve the targeted goal within time and can optimize the time period required to complete the project based on survey made , it is concluded that 50% of contractor can achieve they target within time with the help of modern equipment. It is also found that few of them have completed the work before time. In which crane is considered to be important part of construction industries they play important role in vertical circulation of material and transportation.

The efficiency of crane depends upon the type of crane used. There are no's of crane with different boom and jib and different working methods. Tower crane is one of the best options to use in India. As environment condition and studied a single zip tower crane is used. As without the help of the staircase we can transport the material. This reduces the frequency of accidents and provides safety to labors.