Appendix A

Data Collection

Table A.1: Gathered data of failure rate and repair rate from literature

Components of PV system	Failure rate*10^{-6} ($hour^{-1}$)	Repair rate ($hour^{-1}$)	References
PV modules	26.000	NA	[102]
	3.2000	0.0667	[103]
	4.6000	0.0057	[104]
	0.0150	0.0037	[8, 42, 105, 106]
	0.0150	0.0037	[36]
	1.4000	NA	[107]
	0.0046	0.0250	[108]
	24.000	0.0039	[9]
	NA	0.0083	[51]
Converter	5.9000	NA	[102]
	8.1000	0.13	[103]
	27.000	0.1000	[109]
	0.4600	0.0250	[108]
Bypass diode	5.4000	0.1667	[103]
	0.3100	0.0208	[8, 42, 105, 106]
	0.3100	0.0208	[36]
	3.5000	NA	[51]
	0.6800	NA	[107]
	0.3100	0.0208	[9]
DC switch	0.2000	0.0208	[8, 42, 105, 106]
	0.2000	0.0207	[36]
	0.7000	NA	[107]
	0.2000	0.0208	[9]
AC Switch	0.0340	0.0208	[8, 42, 105, 106]
	0.0340	0.0207	[36]
	0.7000	NA	[107]
	0.0340	0.0208	[9]
AC Circuit Breaker (CB)	5.7000	0.0208	[8, 42, 105, 106]
	5.7000	0.0207	[36]
	0.4000	NA	[107]
	5.7000	0.0208	[9]

Table A.2: Gathered data of failure rate and repair rate from literature

Components of PV system	Failure rate*10^{-6} ($hour^{-1}$)	Repair rate ($hour^{-1}$)	References
Differential CB	5.7000	0.0208	[8, 42, 105, 106]
	5.7000	0.0207	[36]
	0.2300	NA	[107]
	5.7000	0.0208	[9]
Grid Protection	5.7000	0.0208	[8, 42, 105, 106]
	5.6000	0.0207	[36]
	5.7000	0.0208	[9]
connector	0.0002	0.0015	[8, 42, 105, 106]
	0.0002	0.0016	[36]
	0.4500	NA	[107]
	0.0002	0.0015	[9]
Inverter	20.000	NA	[102]
	13.000	0.0833	[103]
	11.000	0.0057	[104]
	40.000	0.0021	[8, 42, 105, 106]
	27.000	0.1000	[109]
	40.000	0.0021	[36]
	7.6000	0.0025	[51]
	180.00	NA	[107]
	57.000	0.0057	[108]
	NA	0.0021	[9]
Charge controller	44.000	NA	[102]
	14.000	NA	[104]
	6.4000	0.0161	[8, 42, 105, 106]
	6.4000	0.0006	[36]
Battery system	19.000	NA	[102]
	11.000	0.0057	[103]
	13.000	0.0060	[36]

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List of Publications

From Thesis Work

A. SCIE Journals

1. **Kumari Sarita**, Sachin Kumar, R.K. Saket, ”OC fault diagnosis of multilevel inverter using SVM technique and detection algorithm.” Computers & Electrical Engineering, Elsevier, Vol. 96, Part A, 107481 (2021), doi: https://doi.org/10.1016/j.compeleceng.2021.107481 **(SCIE)**

2. **Kumari Sarita**, Sachin Kumar, Aanchal Singh S. Vardhan, Rajvikram Madurai Elavarasan, R.K. Saket, G.M. Shafiullah, Eklas Hossain, “Power Enhancement With Grid Stabilization of Renewable Energy-Based Generation System Using UPQC-FLC-EVA Technique”. IEEE Access, Vol. 8, pp. 207443-207464 (2020) doi: 10.1109/ACCESS.2020.3038313 **(SCIE)**

3. **Kumari Sarita**, Sachin Kumar, R.K. Saket, R.C. Bansal, “Fault Diagnosis of Inverters Using Wavelet Entropy Based PCA-SVM Technique”, IEEE Transactions on Power Electronics. **(Resubmitted after Revision)**

4. **Kumari Sarita**, Sachin Kumar, R.K. Saket, D.P. Kothari, “Fault Diagnosis of Inverters Using Walsh-Function Based KNN Technique”, IEEE Transactions on Power Electronics. **(Resubmitted after Revision)**

5. **Kumari Sarita**, Saumya Singh, R.K. Saket, S.P. Bihari, Baseem Khan, “Reliability and Availability Analysis of Inverters of Grid-Connected Solar Photovoltaic Systems”, IET Renewable Power Generation. **(Communicated)**

6. **Kumari Sarita**, Saumya Singh, R.K. Saket, Anand Kumar K.S., D.P. Kothari, “Walsh Function based Open Circuit Fault Detection Algorithm for Power Inverters of Industrial

Drive Systems", IEEE Transactions on Circuits and Systems II: Express Briefs. **(Communicated)**

B. Book Chapter

1. **Kumari Sarita**, Sachin Kumar, R.K. Saket, "Fault Detection of Smart Grid Equipment Using Machine Learning and Data Analytics", Springer Lecture Notes in Electrical Engineering 693, Proceedings of International Conference on Emerging Trends for Smart Grid Automation and Industry 4.0, Jharkhand, India (2020), doi: 10.1007/978-981-15-7675-1

C. Conference Proceeding

1. **Kumari Sarita**, Sachin Kumar, R.K. Saket, "Fault Detection of Smart Grid Equipment Using Machine Learning and Data Analytics", International Conference on Emerging Trends for Smart Grid Automation and Industry 4.0, BIT-Mesra, Ranchi, Jharkhand, India (2019).

Work with PSRT Research Team

A. Journals

1. Sachin Kumar, **Kumari Sarita**, R.K. Saket, Dharmendra Kumar Dheer, R.C. Bansal, Saad Mekhilef, "Reliability Assessment for DFIG-based WECS Considering the Impact of 3-phase Fault and Lightning Impulse Voltage", International Transactions on Electrical Energy Systems, Wiley, pp. 1-19, e12952 (2021).

2. Sachin Kumar, **Kumari Sarita**, Akanksha S.S. Vardhan, Rajvikram Elavarasan, R.K. Saket, Narottam Das, "Reliability Assessment of Wind-Solar PV Integrated Distribution System using Electrical Loss Minimization Technique", Energies. Vol. 13, No. 21, pp. 1-30 (2020).

3. Sachin Kumar, **Kumari Sarita**, R.K. Saket, Dharmendra Kumar Dheer, "Reliability assessment of optimally DG integrated distribution system based on power loss minimization", Electric Power Components and Systems, Taylor & Francis **(In Press)**

4. K.S. Anand Kumar, **Kumari Sarita**, Sachin Kumar, R.K. Saket, Akshay Swami, "Machine Learning-based Approach for Prevention of COVID-19 using Steam Vaporiser", GMSARN International Journal, Vol. 16, No. 04, pp. 1-6, 2022. **(Scopus Indexed)**

5. Om Prakash Bharti, **Kumari Sarita**, Aanchal Singh S. Vardhan, Akanksha Singh S. Vardhan, R.K. Saket, "Controller design for DFIG-based WT using gravitational search algorithm for wind power generation." IET Renewable Power Generation Vol. 15, No. 09, pp. 1956-1967 (2021),
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6. Bihari, Shiv Prakash, Pradip Kumar Sadhu, **Kumari Sarita**, Baseem Khan, L. D. Arya, R. K. Saket, and D. P. Kothari. "A Comprehensive Review of Microgrid Control Mechanism and Impact Assessment for Hybrid Renewable Energy Integration." IEEE Access (2021). **(SCIE)**

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9. **Kumari Sarita**, Ramesh Devarapalli, Pankaj Rai, "Modeling and Control of Dynamic Battery Storage System used in Hybrid Grid." Energy Storage, Wiley, Vol. 2, no. 3 (2020): e146. **(SCIE)**

B. Book Chapters

1. Hamdy, Mohamed, Mahmoud A. Attia, Almoataz Y. Abdelaziz, Sachin Kumar, **Kumari Sarita**, and R. K. Saket. "Performance Enhancement of STATCOM Integrated Wind Farm for Harmonics Mitigation Using Optimization Techniques." In ICT Analysis and Applications, pp. 507-516. Springer, Singapore, 2021.

2. Hare Shankar Kumhar, Kumari Sarita, Vikas Kukshal, Sanjeev Kumar, "Predictive Maintenance of Industrial Rotating Equipment Using Supervised Machine Learning", Taylor

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3. Mohamed Hamdy, Mahmoud A. Attia, Almoataz Y. Abdelaziz, Sachin Kumar, **Kumari Sarita**, R.K. Saket, "Performance enhancement of STATCOM integrated Wind Farm for harmonics mitigation using optimization techniques", Springer Lecture Notes in Networks and Systems 154, ICT Analysis and Applications, Proceedings of ICT4SD Goa India, Vol. 2, pp 507-516 (2020) doi: https://doi.org/10.1007/978-981-15-8354-4

4. Hare Shankar Kumhar, **Kumari Sarita**, and Sanjeev Kumar. "Dynamic-Balance Monitoring Scheme for Industrial Fans using Neural-Network based Machine Learning Approach." In Interdisciplinary Research in Technology and Management, pp. 612-618. CRC Press (Taylor & Francis), 2021.

5. Omar M. Saber, Mahmoud A. Attia, Almoataz Y. Abdelaziz, **Kumari Sarita**, Aanchal Singh S. Vardhan, Akanksha Singh S. Vardhan, R. K. Saket, "Maximizing the Output Power of Wave Energy Conversion System by Using Model Predictive Controller Based on Equilibrium Optimizer" In International Conference on. Intelligent Computing, Information and Control Systems · ICICCS 2021, Springer, 2021. **(In Press)**

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C. Conferences

1. Mohamed Hamdy, Mahmoud A. Attia, Almoataz Y. Abdelaziz, Sachin Kumar, **Kumari Sarita**, R. K. Saket, "Performance enhancement of STATCOM integrated Wind Farm for harmonics mitigation using optimization techniques", ICT Analysis and Applications, Proceedings of ICT4SD Goa India (2020).

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