

## LIST OF PUBLICATIONS

### ❖ International Journals:

1. **Om Prakash Bharti**, R. K. Saket, S.K. Nagar, “*Controller Design for Doubly Fed Induction Generator Using Particle Swarm Optimization Technique*,” **Renewable Energy, Science Direct, Elsevier 114 (part-B), 2017, 1394-1406**; Indexed in SCIE (**Thomson Reuters/Web of Science/Scopus**).
2. **Om Prakash Bharti**, R. K. Saket, S.K. Nagar, “*Controller Design of DFIG Based Wind Turbine by Using Evolutionary Soft Computational Techniques*”, Engineering, Technology & Applied Science Research, **Vol. 7, No. 3, 2017, 1732-1736**. ETASR indexed in ESCI (**Thomson Reuters/Web of Science**).
3. **O. P. Bharti**, R. K. Saket, S. K. Nagar, “*Controller Design For DFIG Driven By Variable Speed Wind Turbine Using Static Output Feedback Technique*”, Engineering, Technology & Applied Science Research, **Vol. 6, No. 4, 2016, 1056-1061**. ETASR indexed in ESCI (**Thomson Reuters/Web of Science**).
4. A. Y. Abdelaziz, R. A. Swief, M. Ezzat, Waleed A. Hamed, R. K. Saket, and **O. P. Bharti**, “*The Impact of Distributed Generation on Voltage Stability Using Differential Evolution Optimization Algorithm*”, International Journal of Applied Engineering Research(IJAER), **Vol. 10, No. 44, 2015, 30783-30789**. IJAER indexed in **Scopus**.
5. **Om Prakash Bharti**, “*Direct Digital Control*”, IOSR Journal of Electrical and Electronics Engineering (IOSR-JEEE), **Vol. 7, No. 4, 2013, 06-10**.

### ❖ BOOK CHAPTER:

1. Ahmed M, Atallah, Almoataz Y. Abdelaziz, Mohamed Ali, R.K. Saket, and **O. P. Bharti**, “*Reliability assessment and economic evaluation of offshore wind farm using stochastic probability*”, (Book: Advances in Intelligent Systems and Computing), LNEE Springer Verlag Germany; 394, 25-37. 2016.

#### ❖ Indexed National & International Conferences:

##### Conference papers presented in abroad

1. **O.P. Bharti**, R.K. Saket, S.K. Nagar, “*Reliability Analysis of DFIG Based Wind Energy Conversion System*”, **International Conference on Renewable Energy Technology (ICRET-2017)**, January 22-24, 2017, Thammasat University, Klong Luang, Pathumthani, **Bangkok, Thailand**, pp: 313-317, 2017 **{BEST PAPER AWARD}**.
2. **Om Prakash Bharti**, R.K. Saket, S.K. Nagar, “*Controller Design of DFIG-based WT by Using DE-Optimization Techniques*”, **4<sup>TH</sup> SICE International Symposium on Control Systems (ISCS)** , March 9-11, 2018 , Setagaya Campus, Tokyo City University, Tokyo, **Japan** and Publication in the IEEE Explore in **ISCS-2018, TCU Tokyo, Japan**.

##### Conference papers presented in India

1. Rahul Gangwani, **Om Prakash Bharti**, R.K. Saket, Shiv Lal, “*On-Off control based maximum power point tracking of wind turbine equipped by DFIG connected to the grid*”, **Advances in Power Generation from Renewable Energy Sources (APGRES 2017)**, **December 22-23,2017**, Government Engineering College, Banswara, Rajasthan, pp: 162-168, 2017.
2. **O.P. Bharti**, R.K. Saket, S.K. Nagar, “*Design of PI controller for doubly fed induction generator using static output feedback*”, IEEE 39th National Systems Conference (NSC) Electronic ISBN: 978-1-4673-6829-2, **Noida, India,2015**.

#### ❖ Papers Communicated:

1. **Om Prakash Bharti**, R. K. Saket and S.K.Nagar, “A Critical Review on the Control Aspects of DFIG Based Wind Energy Conversion System,” **IET Renewable Power Generation, under review 2018**.

2. **Om Prakash Bharti**, R. K. Saket, S.K. Nagar, “*Controller Design for DFIG Based WT by Using Firefly Algorithm Technique*”, **Renewable and Sustainable Energy Review**. Under Review 2018. SCI Journal (Thomson Reuters/Scopus/Web of Science).
3. **Om Prakash Bharti**, R. K. Saket, S.K. Nagar, “*Controller Design for DFIG Based WT by Using Differential Evolution Technique*”, **Renewable and Sustainable Energy Review**. Under Review 2018. SCI Journal (Thomson Reuters/Scopus/Web of Science).
4. **Om Prakash Bharti**, R. K. Saket, S.K. Nagar, “*Reliability assessment and Performance analysis of DFIG based WT for wind energy conversion system*” **International Journal of Reliability and Safety**, from Inderscience Publishers, Under Review 2018. SCOPUS Indexed Journal.

## APPENDICES

### Appendix chapter 2: Simulation Data

Base values:  $S_b = 2 \text{ MVA}$ ,  $V_b = 690 \text{ V}$ ,  $\omega_b = 2\pi f$  (rad/s),  $f = 60 \text{ Hz}$ ,  $Z_{dc} = V_{dc}/I_{dc}$ ,  $I_b = 1900 \text{ A}$ ,  
 $V_{dc} = 1200 \text{ V}$ ,  $Z_b = (V_b/\sqrt{3})/I_b$ ,  $L_b = Z_b/\omega_b$ ,  $L_{dc} = Z_{dc}/\omega_b$ ,  $C_b = 1/(Z_b \omega_b)$ ,  $T_b = S_b/\omega_b$ ,  $J_b = S_b/(\omega_b^2)$ ,  $I_{dc} = S_b/Y_{dc}$ ,  $C_{dc} = 1/(Z_{dc}\omega_b)$

Infinite bus voltage (Pu):  $V_{dq, inf} = [0.989 \quad 0.15]$

Line parameter (Pu):  $R_{TL} = 0.012$ ,  $L_{TL} = 0.12$ ,  $R_{ca} = 0.0049$ ,  $L_{ca} = 0.0251$ ,  $C_{ca} = 0.2502$

$R_{filt} = 0.0012$ ,  $L_{filt} = 0.0209$ ,  $R_{tr} = 0.000366$ ,  $L_{tr} = 0.0103$

DFIG (Pu):  $R_s = 0.00920$ ,  $R_r = 0.00760$ ,  $L_s = 0.190$ ,  $L_r = 0.07920$ ,  $L_m = 4.59260$

Maximum operating limit of VSC (Pu) also cut-in as well as cut-out wind speed

$S_{max} = 0.3$ , cut-in wind speed: 4 m/s, cut-out wind speed: 22 m/s

Controller gains (Pu):

Rotor-side converter

PI<sub>1</sub> and PI<sub>3</sub> Controllers:  $K_P = 0.0252$ ,  $k_i = 10.4832$

PI<sub>2</sub> and PI<sub>4</sub> Controllers:  $K_P = 0.9995$ ,  $k_i = 20$

Grid-side converter

PI<sub>5</sub> and PI<sub>6</sub> Controllers:  $K_P = 0.7147$ ,  $k_i = 7.1515$

DC link module:  $v_{dc}^{ref} = 1$ ,  $C_{dc} = 12.7227$ ,  $k_p = 0.9544$ ,  $k_i = 3.8175$

### Appendix Chapters 3, 4, 5, 6: DFIG Simulation Data

DFIG (Pu):  $R_s = 0.023$ ,  $R_r = 0.016$ ,  $L_s = 0.180$ ,  $L_r = 0.16$ ,  $L_m = 2.9$ ,  $V_{dc} = 1150 \text{ V}$ ,

Power= 1.5 MW, Stator resistance  $R_s=0.023$ , Rotor resistance  $R_r=0.016$ , Stator phase inductance

$L_s = 0.18\text{H}$ , Rotor phase inductance  $L_r=0.16\text{H}$ , Generator inertia  $J= 0.0685 \text{ kg m}^2$ , Friction factor

$f= 0.01 \text{ N m s}$ , Pitch angle  $\beta=45^\circ$