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DAFTAR PUSTAKA

[1] International Energy Agency, "Electricity 2026," IEA, Paris, Tech. Rep., 2026, licence: CC BY 4.0.

[2] ——, "Enhancing Indonesia's Power System," IEA, Paris, Tech. Rep., 2022, licence: CC BY 4.0.

[3] PT PLN (Persero), "Rencana Usaha Penyediaan Tenaga Listrik (RUPTL) PLN 2025–2034," PT PLN (Persero), Jakarta, Tech. Rep., 2025.

[4] International Renewable Energy Agency, "Renewable Capacity Highlights 2025," IRENA, Abu Dhabi, Tech. Rep., 2025, 26 March 2025.

[5] Kementerian Energi dan Sumber Daya Mineral Republik Indonesia, "Hingga 2030, Pemerintah Bidik Tambahan Kapasitas Terpasang PLTB 5 GW," Arsip Berita Kementerian ESDM RI, 2025.

[6] N. A. Pambudi, D. K. Ulfa, I. R. Nanda, I. M. Gandidi, A. Wiyono, M. K. Biddinika, B. Rudiyanto, and L. H. Saw, "The Future of Wind Power Plants in Indonesia: Potential, Challenges, and Policies," *Sustainability*, vol. 17, no. 3, p. 1312, 2025.

[7] D. Gautam, V. Vittal, and T. Harbour, "Impact of Increased Penetration of DFIG-Based Wind Turbine Generators on Transient and Small Signal Stability of Power Systems," *IEEE Transactions on Power Systems*, vol. 24, no. 3, pp. 1426–1434, 2009.

[8] P. He, F. Wen, G. Ledwich, Y. Xue, and J. Huang, "Investigation of the Effects of Various Types of Wind Turbine Generators on Power-System Stability," *Journal of Energy Engineering*, vol. 141, no. 3, p. 04014007, 2015.

[9] B. Sun, Z. He, Y. Jia, and K. Liao, "Small-Signal Stability Analysis of Wind Power System Based on DFIG," *Energy and Power Engineering*, vol. 5, no. 4B, pp. 418–422, 2013.

[10] W. Liu, R. Ge, H. Li, and J. Ge, "Impact of Large-Scale Wind Power Integration on Small Signal Stability Based on Stability Region Boundary," *Sustainability*, vol. 6, no. 11, pp. 7921–7944, 2014.

[11] T. Knüppel, V. Akhmatov, J. N. Nielsen, K. H. Jensen, A. Dixon, and J. Østergaard, "Small-Signal Stability Analysis of Full-Load Converter Interfaced Wind Turbines," in *8th International Workshop on Large-Scale Integration of Wind Power into Power Systems as well as on Transmission Networks for Offshore Wind Farms*, 2009.

[12] F. Wu, X.-P. Zhang, and P. Ju, "Small Signal Stability Analysis and Control of the Wind Turbine with the Direct-Drive Permanent Magnet Generator Integrated to the Grid," *Electric Power Systems Research*, vol. 79, no. 12, pp. 1661–1667, 2009.

[13] R. Wang, L. Shi, L. Yao, and Y. Ni, "Small Signal Stability Analysis with High Penetration of Grid-Connected Wind Farm of PMSG Type Considering the Wake Effect," in *2014 IEEE PES General Meeting*. IEEE, 2014, pp. 1–5.

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[14] B. Mehta, P. Bhatt, and V. Pandya, "Small signal stability analysis of power systems with DFIG based wind power penetration," *International Journal of Electrical Power & Energy Systems*, vol. 58, pp. 64–74, 2014.

[15] P. K. Nirala, R. Bhushan, and K. M. Jagtap, "Impact of System Parameters on Modal Analysis of a DFIG Open-Loop System under Weak, Moderate, and Strong Grid Conditions," *Wind Engineering*, vol. 49, no. 5, pp. 1210–1232, 2025.

[16] A. Pepiciello, J. L. Domínguez-García, and A. Vaccaro, "The Impact of Frequency Support by Wind Turbines on the Small-Signal Stability of Power Systems," *Energies*, vol. 15, no. 8470, pp. 1–20, 2022.

[17] J. Luo, Y. Zou, S. Bu, and U. Karaagac, "Converter-Driven Stability Analysis of Power Systems Integrated with Hybrid Renewable Energy Sources," *Energies*, vol. 14, no. 4290, pp. 1–20, 2021.

[18] G. Li, R. Han, B. Liu, and Z. Li, "Small-Signal Stability Analysis and Optimization of Grid-Forming Permanent-Magnet Synchronous-Generator Wind Turbines," *Energies*, vol. 17, no. 4560, pp. 1–15, 2024.

[19] G. Jin, F. Li, C. Yin, J. Liu, and T. Wang, "Analysis of Small-Disturbance Stability of Onshore Wind Power All-DC Power Generation System and Identification of Leading Factors," *Electronics*, vol. 13, no. 8, pp. 1–19, 2024.

[20] M. A. Mostafa, E. A. El-Hay, and M. M. ELkholy, "Recent Trends in Wind Energy Conversion System with Grid Integration Based on Soft Computing Methods: Comprehensive Review, Comparisons and Insights," *Archives of Computational Methods in Engineering*, vol. 30, pp. 1439–1478, 2023.

[21] P. Kundur, *Power System Stability and Control*. New York: McGraw-Hill, 1994.

[22] N. Hatziargyriou, J. V. Milanovic, C. Rahmann, V. Ajjarapu, C. Cañizares, I. Erlich, D. J. Hill, I. A. Hiskens, I. Kamwa, B. Pal, P. Pourbeik, J. J. Sanchez-Gasca, A. M. Stankovic, T. Van Cutsem, V. Vittal, and C. Vournas, "Definition and classification of power system stability – revisited & extended," *IEEE Transactions on Power Systems*, vol. 36, no. 4, pp. 3271–3281, 2021.

[23] P. W. Sauer and M. A. Pai, *Power System Dynamics and Stability*. Champaign, Illinois: Stipes Publishing, 2006.

[24] K. Ogata, *Modern Control Engineering*, 5th ed. Upper Saddle River, New Jersey: Prentice Hall, 2010.

[25] DIgSILENT GmbH, *PowerFactory 2024 Technical Reference: Synchronous Machine (ElmSym, TypSym)*, DIgSILENT GmbH, Gomaringen, Germany, 2024.

[26] A. Rolán, F. Córcoles, and J. Pedra, "Doubly Fed Induction Generator Subject to Symmetrical Voltage Sags," *IEEE Transactions on Energy Conversion*, 2011.

[27] DIgSILENT GmbH, *PowerFactory 2024 Technical Reference: Asynchronous Machine (ElmAsm, TypAsmo)*, DIgSILENT GmbH, Gomaringen, Germany, 2024.

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[28] ——, *PowerFactory 2024 Technical Reference: Doubly-Fed Induction Machine (ElmAsmsc, TypAsmo)*, DIgSILENT GmbH, Gomaringen, Germany, 2024.

[29] Y. Yang, Y. Li, X. Yuan, J. Li, and Z. Du, "Damping Torque Analysis of the PMSG-Based WT with Supplementary Damping Control for Mitigating Interarea Oscillations," *International Transactions on Electrical Energy Systems*, vol. 2022, p. Article ID 2391770, 2022.

[30] A. Rolán, Á. Luna, G. Vázquez, D. Aguilar, and G. Azevedo, "Modeling of a Variable Speed Wind Turbine with a Permanent Magnet Synchronous Generator," in *2009 IEEE International Symposium on Industrial Electronics (ISIE)*. IEEE, 2009, pp. 734–739.

[31] DIgSILENT GmbH, *PowerFactory 2024 Technical Reference: DIgSILENT Fully Rated Converter Wind Turbine Templates (DIgSILENT FullyRatedConv WTG)*, DIgSILENT GmbH, Gomaringen, Germany, 2024, revision 3, January 9, 2024.

[32] ——, *PowerFactory 2024 Technical Reference: Static Generator (ElmGenstat)*, DIgSILENT GmbH, Gomaringen, Germany, 2024.

[33] P. M. Anderson and A. A. Fouad, *Power Systems Control and Stability*. Ames, Iowa: Iowa State University Press, 1977.

[34] M. Yousefi-kia, M. Niaz Azari, and M. E. H. Golshan, "A novel cyber-attack modelling and detection in overcurrent protection," *IET Generation, Transmission & Distribution*, vol. 17, no. 19, pp. 4319–4332, 2023.

[35] DIgSILENT GmbH, *PowerFactory 2024 Technical Reference: DIgSILENT Doubly Fed Induction Generator Templates (DIgSILENT DFIG WTG)*, DIgSILENT GmbH, Gomaringen, Germany, 2024, revision 3, January 9, 2024.

[36] S. Essallah, A. Bouallegue, and A. Khedher, "Integration of automatic voltage regulator and power system stabilizer: small-signal stability in DFIG-based wind farms," *Journal of Modern Power Systems and Clean Energy*, 2019.

[37] Q. Liu, J. Wu, H. Wang, H. Zhang, and J. Yang, "Effect of DFIG control parameters on small signal stability in power systems," *Scientific Reports*, vol. 13, p. 2476, 2023.

[38] A. A. Alsakati, C. A. Vaithilingam, and J. Alnasseir, "Transient Stability Assessment of IEEE 9-Bus System Integrated Wind Farm," in *MATEC Web of Conferences*, vol. 335. EDP Sciences, 2021, p. 02006.

[39] S. Impram, S. Varbak Nese, and B. Oral, "Challenges of renewable energy penetration on power system flexibility: A survey," *Energy Strategy Reviews*, vol. 31, p. 100539, 2020.

[40] IEA Technology Collaboration Programme, "Wind/PV Integration Studies, 3rd Edition," International Energy Agency Photovoltaic Power Systems Programme, Tech. Rep., 2024, report IEA-PVPS T14-18:2024, December 2024.