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DAFTAR PUSTAKA

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

[2] M. Dreidy, H. Mokhlis, dan S. Mekhilef, "Inertia response and frequency control techniques for renewable energy sources: A review," 1 Maret 2017, *Elsevier Ltd*. doi: 10.1016/j.rser.2016.11.170.

[3] M. Salman dan A. Nasir, "Optimal policy for under frequency load shedding based on heterogeneous Markovian opinion dynamics model," *Alexandria Engineering Journal*, vol. 63, hlm. 599–611, Feb 2023, doi: 10.1016/j.aej.2022.08.015.

[4] A. Reveles-Pinedo, C. R. Fuerte-Esquivel, A. Pizano-Martínez, dan R. Ramírez-Betancour, "Selective optimal under-frequency load shedding based on trajectory sensitivities," *Electric Power Systems Research*, vol. 234, Sep 2024, doi: 10.1016/j.epsr.2024.110810.

[5] A. Rafinia, N. Rezaei, dan J. Moshtagh, "Optimal design of an adaptive under-frequency load shedding scheme in smart grids considering operational uncertainties," *International Journal of Electrical Power and Energy Systems*, vol. 121, Okt 2020, doi: 10.1016/j.ijepes.2020.106137.

[6] Z. Luo, H. Liu, N. Wang, T. Zhao, dan J. Tian, "Optimal adaptive decentralized under-frequency load shedding for islanded smart distribution network considering wind power uncertainty," *Appl. Energy*, vol. 365, Jul 2024, doi: 10.1016/j.apenergy.2024.123162.

[7] PLN UP2B Bali, *Buku Defense Scheme SS Bali 2025*. Denpasar: PT PLN (Persero) Unit Pelaksana Pengatur Beban Bali, 2025.

[8] K. Hou *dkk.*, "A fast optimal load shedding method for power system reliability assessment based on shadow price theory," *Energy Reports*, vol. 8, hlm. 352–360, Apr 2022, doi: 10.1016/j.egyr.2021.11.104.

[9] V. Tamilselvan dan T. Jayabarathi, "A hybrid method for optimal load shedding and improving voltage stability," *Ain Shams Engineering Journal*,

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vol. 7, no. 1, hlm. 223–232, Mar 2016, doi: 10.1016/j.asej.2015.11.003.

[10] M. Ahmadipour, M. Murtadha Othman, Z. Salam, M. Alrifaey, H. Mohammed Ridha, dan V. Veerasamy, "Optimal load shedding scheme using grasshopper optimization algorithm for islanded power system with distributed energy resources," *Ain Shams Engineering Journal*, vol. 14, no. 1, Feb 2023, doi: 10.1016/j.asej.2022.101835.

[11] P. Santurino, L. Sigrist, Á. Ortega, J. Renedo, dan E. Lobato, "Optimal coordinated design of under-frequency load shedding and energy storage systems," *Electric Power Systems Research*, vol. 211, Okt 2022, doi: 10.1016/j.epsr.2022.108423.

[12] H. Awad dan A. Hafez, "Optimal operation of under-frequency load shedding relays by hybrid optimization of particle swarm and bacterial foraging algorithms," *Alexandria Engineering Journal*, vol. 61, no. 1, hlm. 763–774, Jan 2022, doi: 10.1016/j.aej.2021.06.034.

[13] S. Homan, N. Mac Dowell, dan S. Brown, "Grid frequency volatility in future low inertia scenarios: Challenges and mitigation options," *Appl. Energy*, vol. 290, Mei 2021, doi: 10.1016/j.apenergy.2021.116723.

[14] Y. Wang, Z. Zhu, Y. Feng, J. Wang, dan G. Lu, "Estimation of power system inertia and applications for enhancing frequency stability," *Electric Power Systems Research*, vol. 254, Mei 2026, doi: 10.1016/j.epsr.2025.112609.

[15] A. I. Sfetkos, E. O. Kontis, T. A. Papadopoulos, dan G. K. Papagiannis, "A data-driven method for the development of system frequency response models for frequency stability analysis," *Electric Power Systems Research*, vol. 252, Jan 2026, doi: 10.1016/j.epsr.2025.112329.

[16] H. Huang dan F. Li, "Sensitivity analysis of load-damping characteristic in power system frequency regulation," *IEEE Transactions on Power Systems*, vol. 28, no. 2, hlm. 1324–1335, 2013, doi: 10.1109/TPWRS.2012.2209901.

[17] H. M. Dola dan B. H. Chowdhury, "Intentional islanding and adaptive load shedding to avoid cascading outages," dalam *2006 IEEE Power Engineering Society General Meeting, PES*, IEEE Computer Society, 2006. doi: 10.1109/pes.2006.1709349.

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[18] H. Haes Alhelou, M. E. Hamedani Golshan, T. C. Njenda, dan N. D. Hatziargyriou, "An Overview of UFLS in Conventional, Modern, and Future Smart Power Systems: Challenges and Opportunities," 1 Februari 2020, *Elsevier Ltd*. doi: 10.1016/j.epsr.2019.106054.

[19] J. Yang, S. Zhou, G. Cai, C. Liu, dan C. Jiang, "Response-driven adaptive under frequency load shedding scheme based on energy model," *Electric Power Systems Research*, vol. 238, Jan 2025, doi: 10.1016/j.epsr.2024.111150.

[20] M. A. Kabir, A. H. Chowdhury, dan N. Al Masood, "A dynamic-adaptive load shedding methodology to improve frequency resilience of power systems," *International Journal of Electrical Power and Energy Systems*, vol. 122, Nov 2020, doi: 10.1016/j.ijepes.2020.106169.

[21] L. Chen, Z. Lu, Y. Min, R. Yu, B. Liu, dan Q. Chen, "Analysis of power system frequency oscillations with intentional governor deadbands using describing functions," *International Journal of Electrical Power and Energy Systems*, vol. 111, hlm. 390–397, Okt 2019, doi: 10.1016/j.ijepes.2019.04.021.

[22] Z. Liu, W. Yao, J. Wen, dan S. Cheng, "Effect analysis of generator governor system and its frequency mode on inter-area oscillations in power systems," *International Journal of Electrical Power and Energy Systems*, vol. 96, hlm. 1–10, Mar 2018, doi: 10.1016/j.ijepes.2017.09.034.

[23] I. A. Khan, H. Mokhlis, N. N. Mansor, H. A. Illias, L. Jamilatul Awalin, dan L. Wang, "New trends and future directions in load frequency control and flexible power system: A comprehensive review," 15 Mei 2023, *Elsevier B.V.* doi: 10.1016/j.aej.2023.03.040.

[24] I. Gde Made Yoga Semadhi Artha dan A. Murdani, "Security of The Bali Electrical System From Interference Of 4 Marine Electricity Cables with the Adaptive Defense Scheme of The Bali Island," dalam *Proceedings of 2023 4th International Conference on High Voltage Engineering and Power Systems, ICHVEPS 2023*, Institute of Electrical and Electronics Engineers Inc., 2023, hlm. 331–334. doi: 10.1109/ICHVEPS58902.2023.10257418.

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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

[25] J. I. Sarasúa, J. I. Pérez-Díaz, J. R. Wilhelmi, dan J. Á. Sánchez-Fernández, "Dynamic response and governor tuning of a long penstock pumped-storage hydropower plant equipped with a pump-turbine and a doubly fed induction generator," *Energy Convers. Manag.*, vol. 106, hlm. 151–164, Des 2015, doi: 10.1016/j.enconman.2015.09.030.

[26] Jan. Machowski, Janusz. Bialek, dan J. R. . Bumby, *Power system dynamics and stability*. John Wiley, 19981997.

[27] "PES-TR1 Dynamic Models for Turbine-Governors in Power System Studies PREPARED BY THE Power System Dynamic Performance Committee Power System Stability Subcommittee Task Force on Turbine-Governor Modeling," 2013.

[28] "NERC | Report Title | Report Date I Reliability Guideline Application Guide for Modeling Turbine-Governor and Active Power-Frequency Controls in Interconnection-Wide Stability Studies NERC | Application Guide for Modeling Turbine-Governor and Active Power-Frequency Controls in Stability Studies |," 2019.

[29] DIgSILENT GmbH, "Governor DEGOV: Woodward Diesel Governor Model, DIgSILENT PowerFactory 2024," Gomaringen, 2024.

[30] H. Huang dan F. Li, "Sensitivity Analysis of Load-Damping, Generator Inertia and Governor Speed Characteristics in Hydraulic Power System Frequency Regulation," Perth: Australasian Universities Power Engineering Conference (AUPEC 2014), 2014.

[31] K. Islam, D. Kim, dan A. Abu-Siada, "A review on adaptive power system protection schemes for future smart and micro grids, challenges and opportunities," 1 Mei 2024, *Elsevier Ltd*. doi: 10.1016/j.epsr.2024.110241.

[32] S. Bustamante, J. W. Gonzalez, G. J. Lopez, dan H. A. Cardona, "UFLS and Smart Load for Frequency Regulation in Electrical Power System: A Review," 2023, *Institute of Electrical and Electronics Engineers Inc.* doi: 10.1109/ACCESS.2023.3321865.

[33] M. Schaller, G. Banjac, S. Diamond, A. Agrawal, B. Stellato, dan S. Boyd, "Embedded Code Generation With CVXPY," *IEEE Control Syst. Lett.*, vol.

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6, hlm. 2653–2658, 2022, doi: 10.1109/LCSYS.2022.3173209.

[34] Kementerian Energi dan Sumber Daya Mineral Republik Indonesia, “Peraturan Menteri Energi dan Sumber Daya Mineral Republik Indonesia Nomor 20 Tahun 2020 tentang Aturan Jaringan Sistem Tenaga Listrik (Grid Code),” Jakarta, 2020.