Author(s): Melicio, R (Melicio, R.); Mendes, VMF (Mendes, V. M. F.); Catalao, JPS (Catalao, J. P. S.)

Title: A Pitch Control Malfunction Analysis for Wind Turbines with Permanent Magnet Synchronous Generator and Full-power Converters: Proportional Integral Versus Fractional-order Controllers

Source: Electric Power Components and Systems, 38 (4): 387-406 2010

Language: English

Document Type: Article

Author Keywords: Fractional-order controller; Pitch control malfunction; Power converters; Power quality; Wind turbines

KeyWords Plus: TRANSIENT STABILITY; RIDE-THROUGH; SYSTEMS; ENHANCEMENT

Abstract: A transient analysis for two full-power converter wind turbines equipped with a permanent magnet synchronous generator is studied in this article, taking into consideration, as a new contribution to earlier studies, a pitch control malfunction. The two full-power converters considered are, respectively, a two-level and a multi-level converter. Moreover, a novel control strategy based on fractional-order controllers for wind turbines is studied. Simulation results are presented; conclusions are in favor of the novel control strategy, improving the quality of the energy injected into the electric grid.

Addresses: [Melicio, R.; Catalao, J. P. S.] Univ Beira Interior, Dept Electromech Engn, P-6201001 Covilha, Portugal; [Mendes, V. M. F.] Inst Super Engn Lisboa, Dept Elect Engn & Automat, Lisbon, Portugal

Reprint Address: Catalao, JPS, Univ Beira Interior, Dept Electromech Engn, R Fonte do Lameiro, P-6201001 Covilha, Portugal.

E-mail Address: catalao@ubi.pt

Publisher: Taylor & Francis INC

Publisher Address: 325 CHESTNUT ST, SUITE 800, PHILADELPHIA, PA 19106 USA

ISSN: 1532-5008

DOI: 10.1080/15325000903330583

29-char Source Abbrev.: ELECTR POWER COMPON SYST

ISI Document Delivery No.: 594DH