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Abstract: In this paper, two wind turbines equipped with a permanent magnet synchronous generator (PMSG) and respectively with a two-level or a multilevel converter are simulated in order to access the malfunction transient performance. Three different drive train mass models, respectively, one, two and three mass models, are considered in order to model the bending flexibility of the blades. Moreover, a fractional-order control strategy is studied comparatively to a classical integer-order control strategy. Computer simulations are carried out, and conclusions about the total harmonic distortion (THD) of the electric current injected into the electric grid are in favor of the fractional-order control strategy. Copyright (C) 2010 Praise Worthy Prize S.r.l. - All rights reserved

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