



# Employing two novel mechanical fault ride through controllers for keeping stability of fixed speed wind generation systems hosted by standalone micro-grid

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## Abstract:

This paper proposes and designs two novel Fault Ride Through (FRT) controllers for maintaining Fixed Speed Wind Generation system (FSWGs) stability during fault events. The first technique has been implemented by increasing the wind turbine blade pitch angle with maximum possible rate to reduce the mechanical extracted wind power and consequently suppress wind generation system acceleration. The second FRT technique has been verified by adapting gear ratio of wind generation system to run far from optimum maximum power point and help FRT process. Effectiveness of the two proposed FRT techniques has been proven by accurate simulation of the most severe disturbance conditions. Also, Results indicated that second technique gives faster response than the first one. Without employing any FRT technique, FSWGs cannot keep its stability and the standalone Micro-Grid (MG) transfers to the blackout mode. Implementation the two FRT techniques requires no additional hardware. Only, control algorithms need little modification to deal with fault event and help FRT process. This fact makes the two proposed FRT techniques are simple, practical and highly economical attractive.

## Keywords:

Standalone micro-grid Fixed speed wind generation system Fault ride through Modified pitch angle controller Variable ratio gear box

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