The power system in the Danish island Bornholm is a distribution system with a high penetration of wind generation, which is representative for expected future power systems. During the period from 11th to 14th September 2007, the Distribution System Operator (DSO) Østkraft in Bornholm conducted a planned islanding operation test. To evaluate the test and achieve useful experience for future similar operations in Bornholm or even in other similar systems, the frequency data before, during and after this period, were recorded by Phasor Measurement Units (PMUs), supplied by Centre for Electric Technology (CET), Technical University of Denmark (DTU). Statistical analysis of frequency data has been performed and the results reveal that the frequency quality during the islanding period was significantly decreased, indicating the need for enhancing frequency control of such systems in the future.