Errata to: Smart Power Grids 2011

Errata to:

Chapter 10: Worst Case Voltage Variation on Microgrid,
doi: http://dx.doi.org/10.1007/978-3-642-21578-0_10
Chapter 13: Decentralized STATCOM/ESS Control for Wind Generators,
doi: http://dx.doi.org/10.1007/978-3-642-21578-0_13
Chapter 20: Modeling and Control of Fuel Cells as Distributed Generators in Smart Grids, doi: http://dx.doi.org/10.1007/978-3-642-21578-0_20

In the original version of these chapters, the following figures and tables were missing.

Chapters	Corrections
Chapter 10	Fig. 10.1 – Fig. 10.14 and Table 10.1
Chapter 13	Fig. 13.1 – Fig. 13.13 and Table 13.1 – 13.2
Chapter 20	Fig. 20.6 and Fig. 20.19

Chapter 10

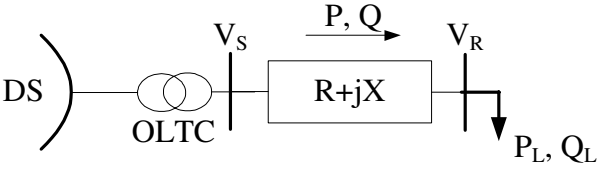

Fig. 10.1 Conventional Two-bus Distribution System

A. Keyhani and M. Marwali (Eds.): Smart Power Grids 2011, POWSYS, pp. E1–E18.
springerlink.com

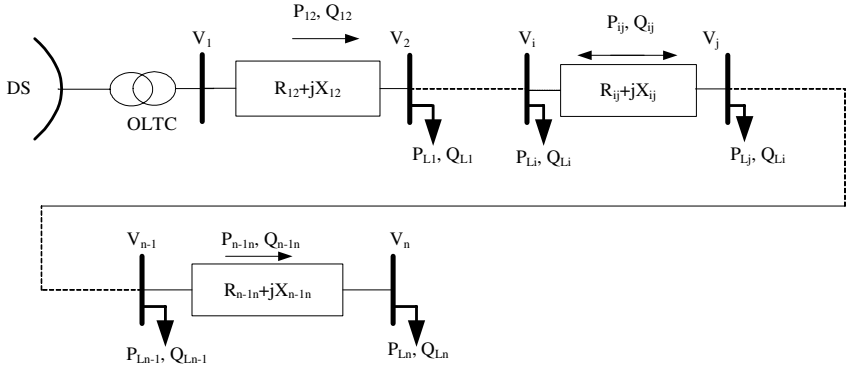

Fig. 10.2 Conventional n-bus Large Distribution System

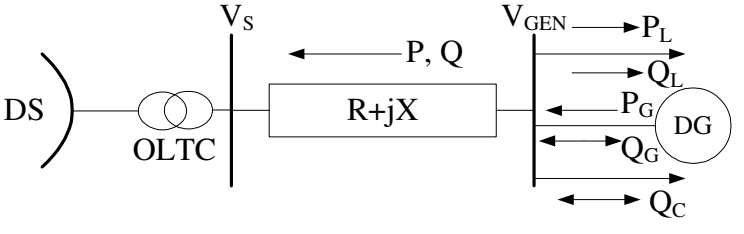

Fig. 10.3 Simple Microgrid

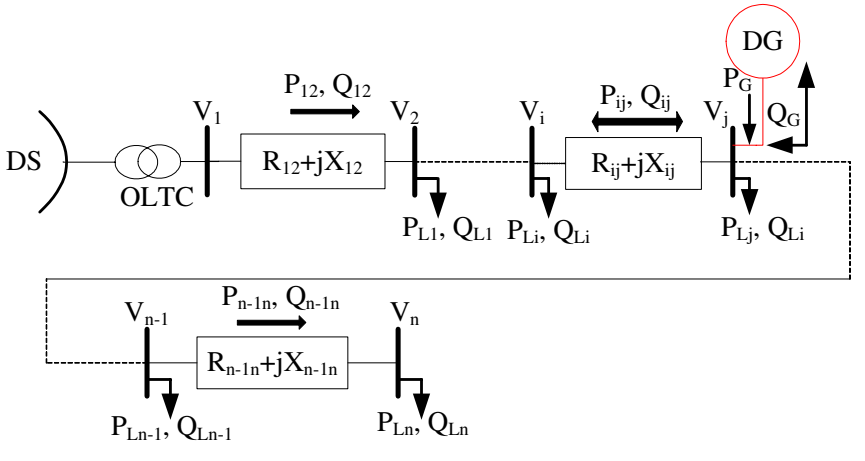

Fig. 10.4 n-bus Large Microgrid

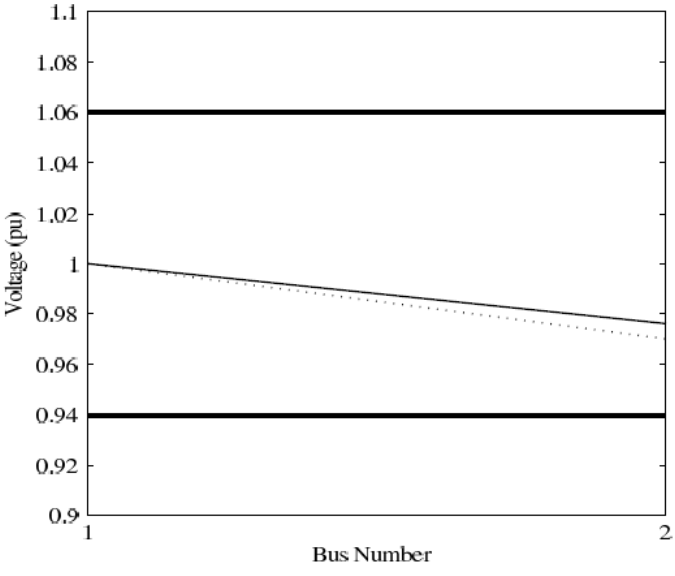

Fig. 10.5 Voltage variation in a conventional two-bus distribution system (The solid line represents the results obtained from PSAT, the dotted line that of from the derived formula and the two bold solid lines indicate the allowable range of voltage variation)

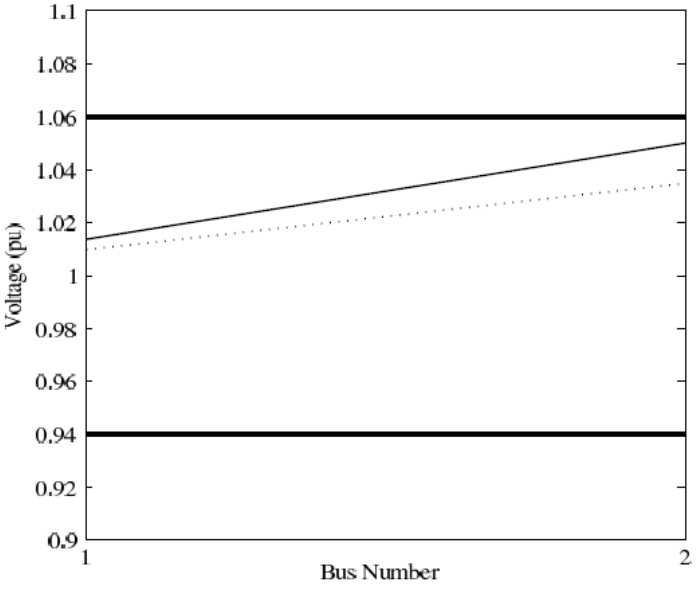

Fig. 10.6 Voltage variation on a simple microgrid with 200 kW of DERs (The solid line represents the results obtained from PSAT, the dotted line that of from the derived formula and the two bold solid lines indicate the allowable range of voltage variation)

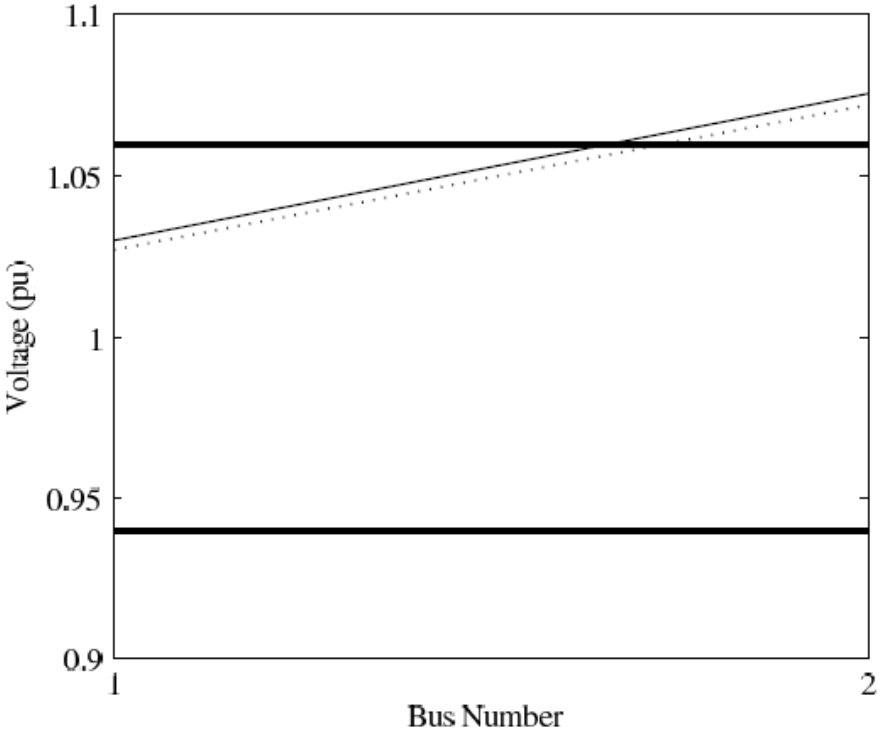

Fig. 10.7 Voltage variation on a simple microgrid with 400 kW of DERs (The solid line represents the results obtained from PSAT, the dotted line that of from the derived formula and the two bold solid lines indicate the allowable range of voltage variation)

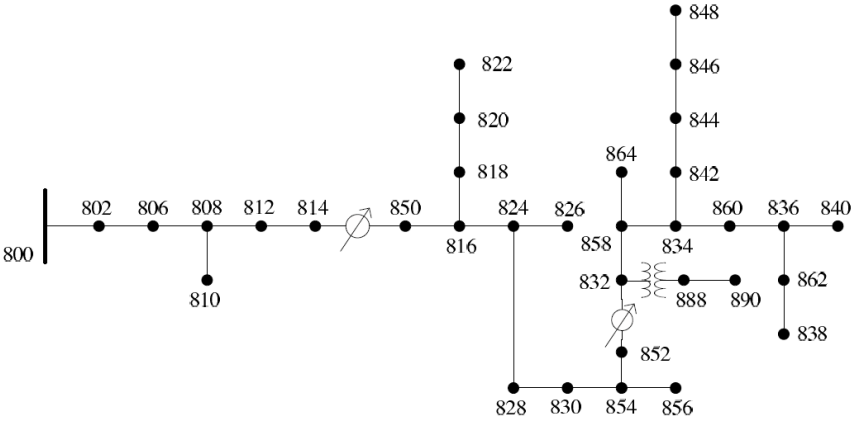

Fig. 10.8 IEEE 34 Node Test Feeder [16]

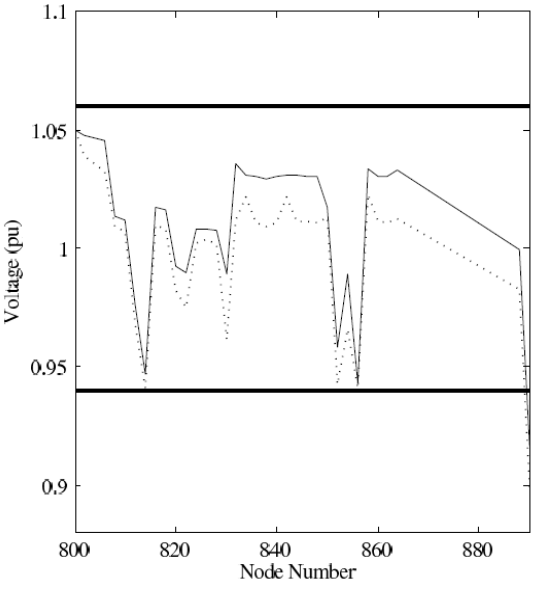

Fig. 10.9 Voltage variation in IEEE 34 Node Test Distribution System (The solid line represents the results obtained from PSSE, the dotted line that of from the derived formula and the two bold solid lines indicate the allowable range of voltage variation)

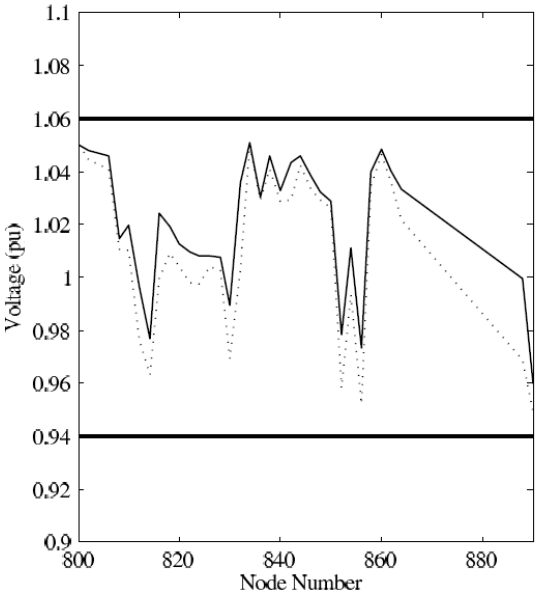

Fig. 10.10 Voltage variation on Large Microgrid with 25% Penetration of DER at Node 834 (The solid line represents the results obtained from PSSE, the dotted line that of from the derived formula and the two bold solid lines indicate the allowable range of voltage variation)

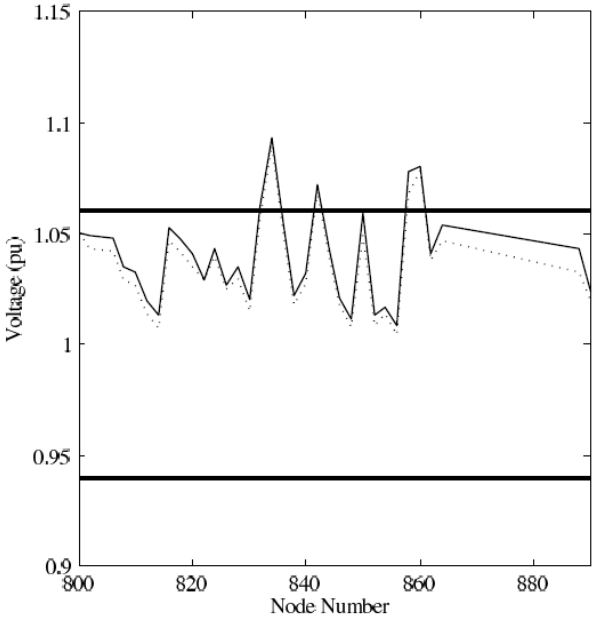

Fig. 10.11 Voltage variation on Large Microgrid with 50% Penetration of DER at Node 834 (The solid line represents the results obtained from PSSE, the dotted line that of from the derived formula and the two bold solid lines indicate the allowable range of voltage variation)

Table 10.1 Network Pricing List (Excluding GST)

Tariff Class	Network Category	Network Access Change (¢/day)
Domestic	LV Res <40 MWh (System)	32.4600
HV Business	HV Connection (System)	891.061
Sub-transmission (ST)	ST Connection	1025.9677

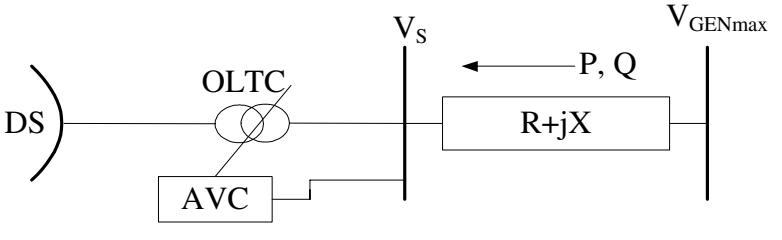

Fig. 10.12 Voltage control using automatic voltage control (AVC)

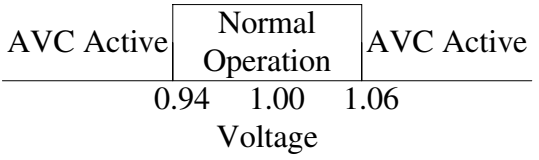

Fig. 10.13 Operation of AVC

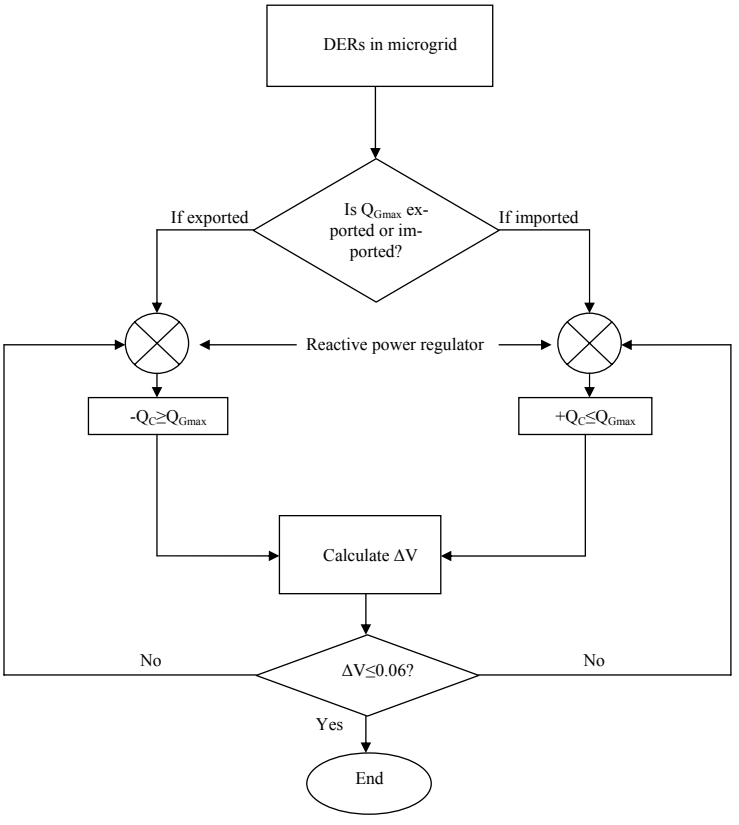

Fig. 10.14 Reactive power control

Chapter 13

Table 13.1 Critical Modes and Participation factors

Modes	Participation factors		
$-0.062 \pm j2.21$	$\Delta\delta_6 = 1$	$\Delta\delta_1 = 0.7738$	$\Delta E_{dr1} = 0.74$
0.018	$\Delta E'_{qr2} = 1$	$\Delta E'_{dr2} = 0.52$	$\Delta s_2 = 0.49$
0.14	$\Delta E'_{qr4} = 1$	$\Delta E'_{dr4} = 0.93$	$\Delta s_4 = 0.29$

Table 13.2 Performance Comparison: (a) proposed controller; and (c) PI-based STATCOM/ ESS

STATCOM/ESS (MVA)	(a) Proposed Controller			(c) PI Control		
150 MVA/95 F	CS (pu)	CCT (s)	Critical voltage (pu)	CS (pu)(s)	CCT (s)	Critical voltage (pu)
150 MVA/95 F	1.35 (pu)	0.165	0.605 (pu)	1.315	0.140 (s)	0.625 (pu)

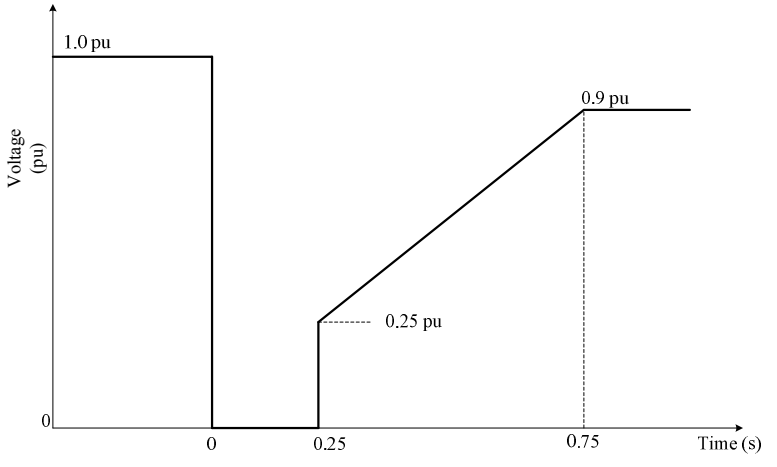

Fig. 13.1 Voltage limit criteria according to grid-code

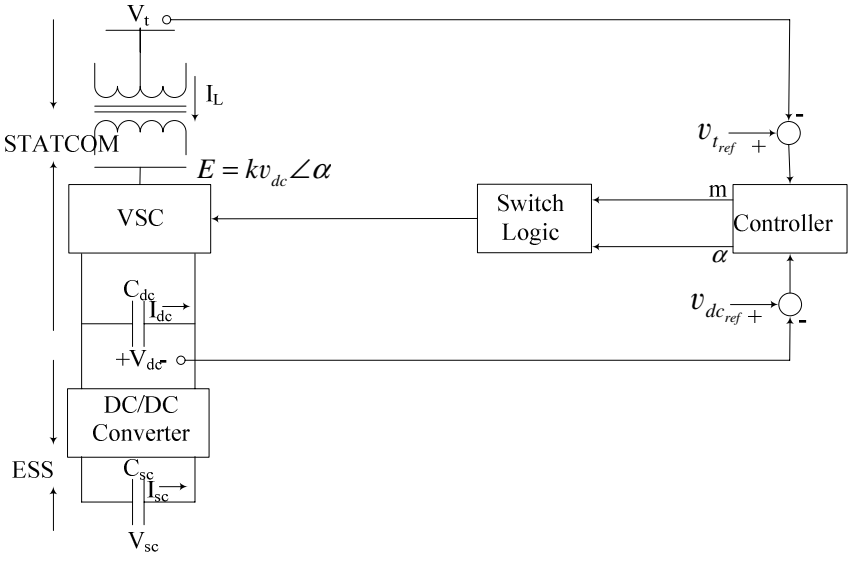

Fig. 13.2 STATCOM/ESS control strategy

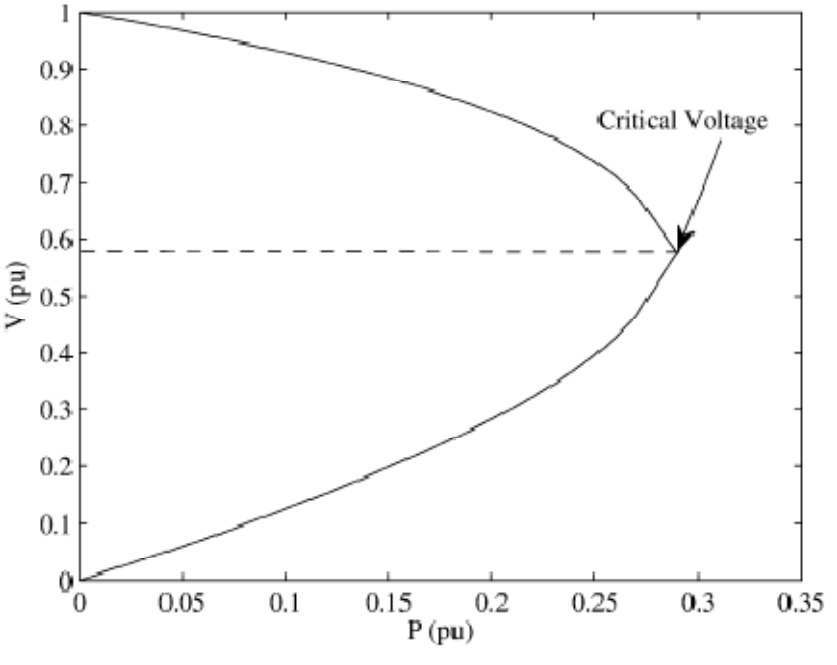

Fig. 13.3 P-V relationship

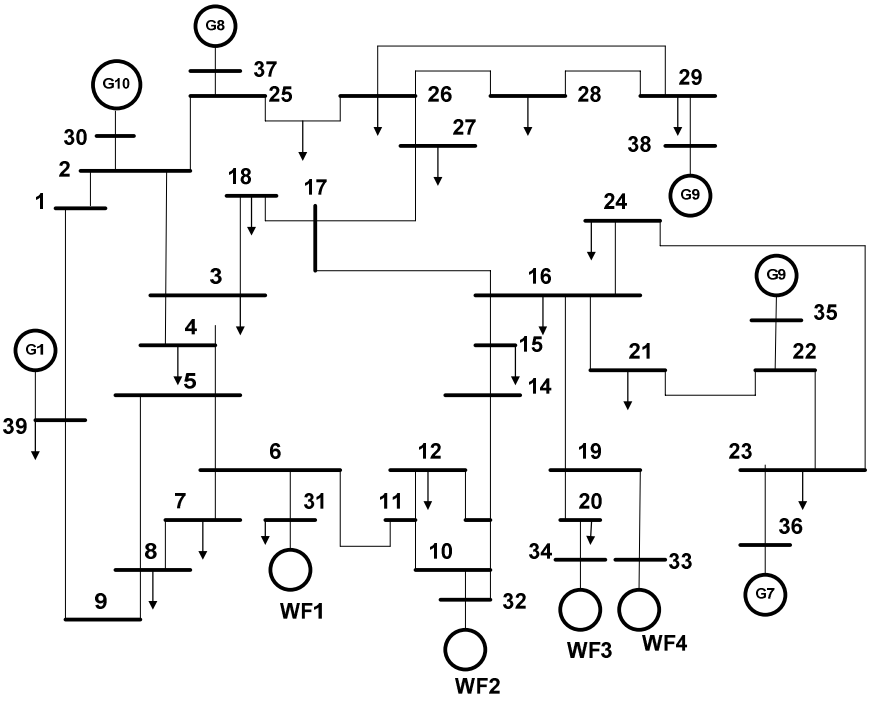

Fig. 13.4 10 machine 39 bus study system

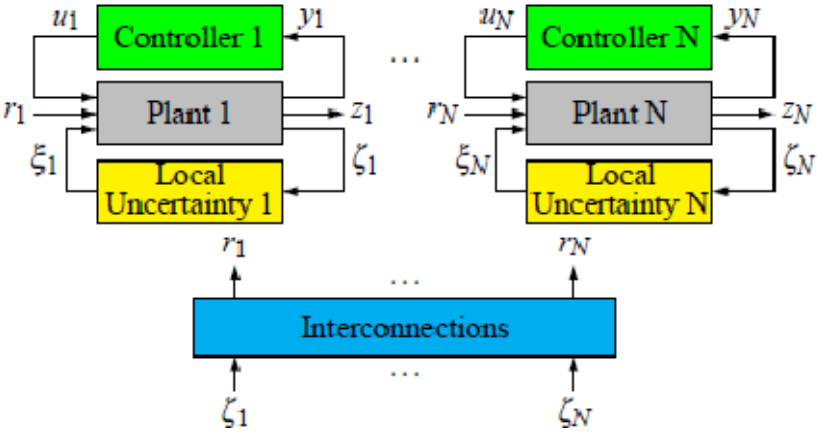

Fig. 13.5 Block diagram of the uncertain system

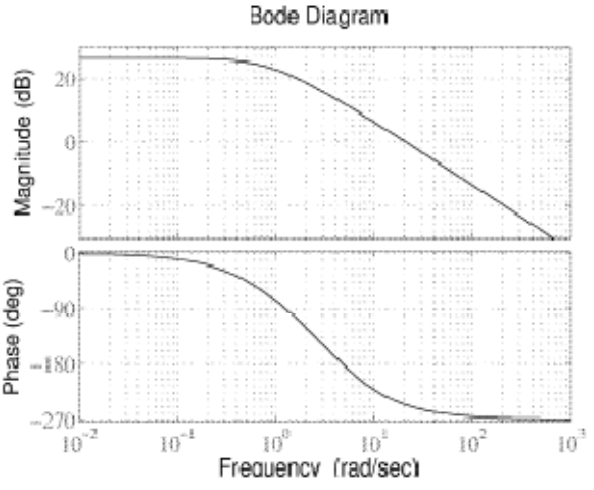

Fig. 13.6 STATCOM/BESS Controller for subsystem 1 - Bode plot of transfer function of Modulation index versus Terminal Voltage

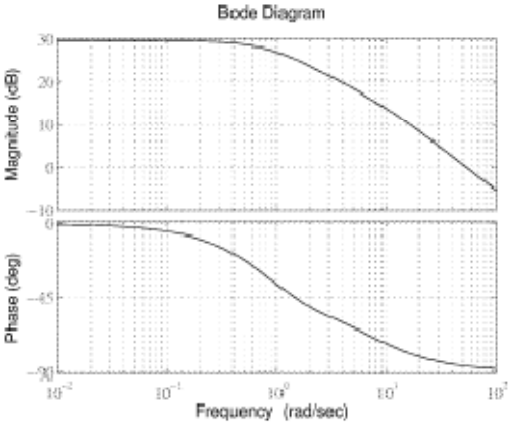

Fig. 13.7 STATCOM/BESS Controller for subsystem 1- Firing angle versus Terminal Voltage

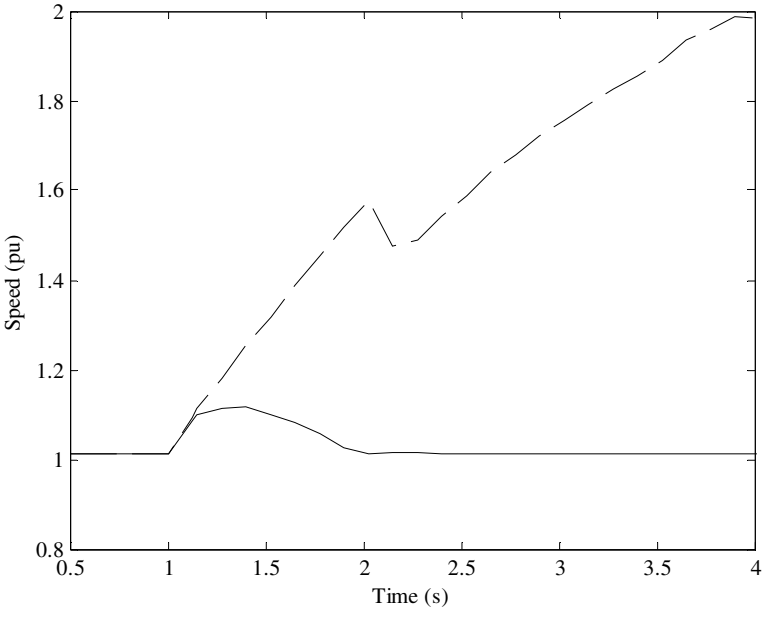

Fig. 13.8(a)

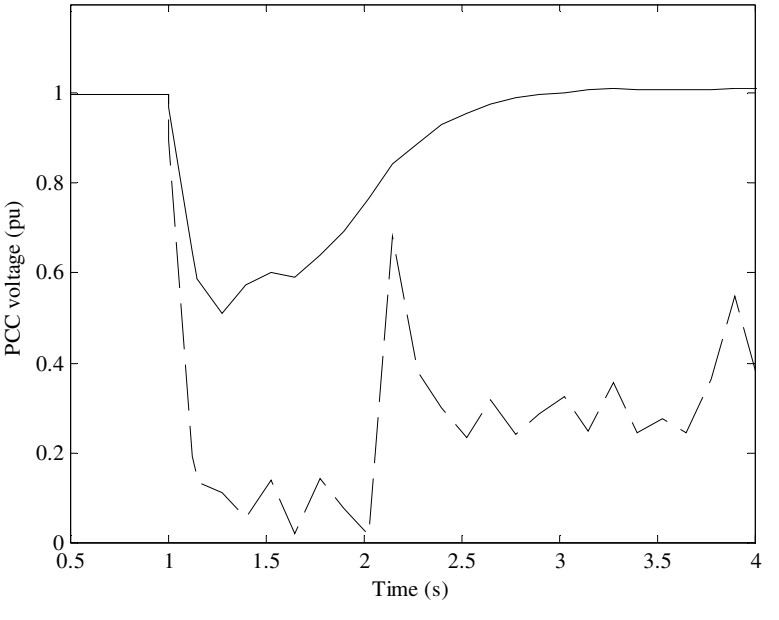

Fig. 13.8(b) Speed and terminal voltage for three-phase fault at bus 11 (Solid line designed and dash line PI-based STATCOM/ESS)

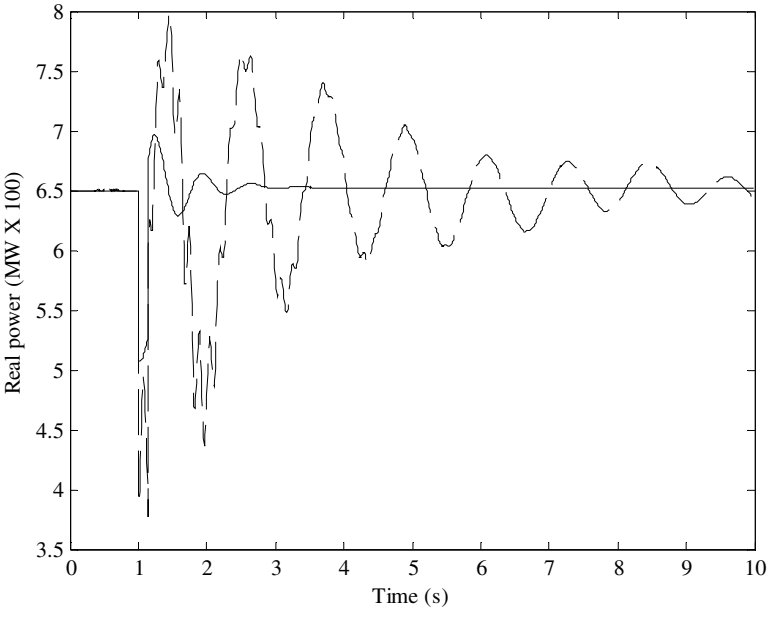

Fig. 13.9(a)

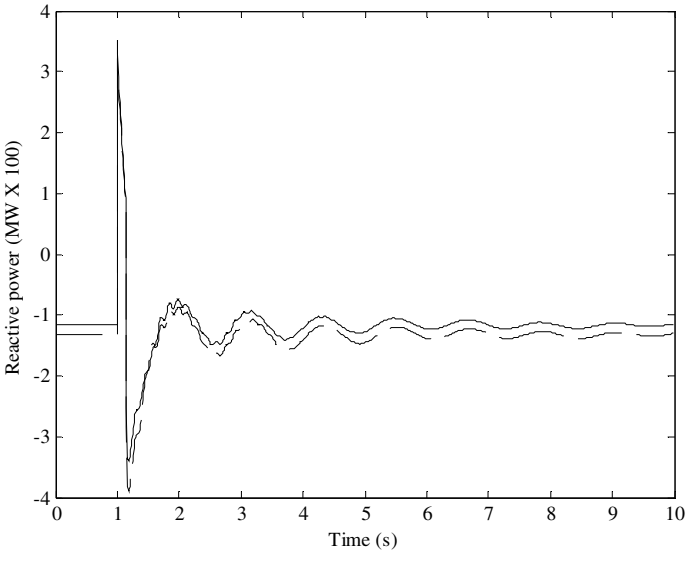

Fig. 13.9(b) Real and reactive power output for a temporary outage of a line 7–8 (In Fig. (a) Solid line designed and dash line PI-based STATCOM/ESS and in Fig. (b) Solid line reactive power absorption by WF_2 and dash line reactive power supply by the designed STATCOM/ESS controller)

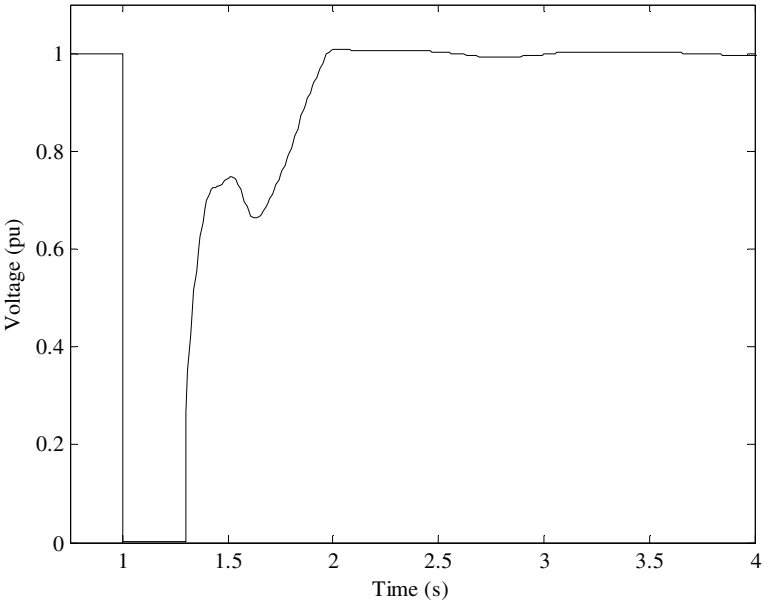

Fig. 13.10 Terminal voltage with zero-voltage for 300 ms

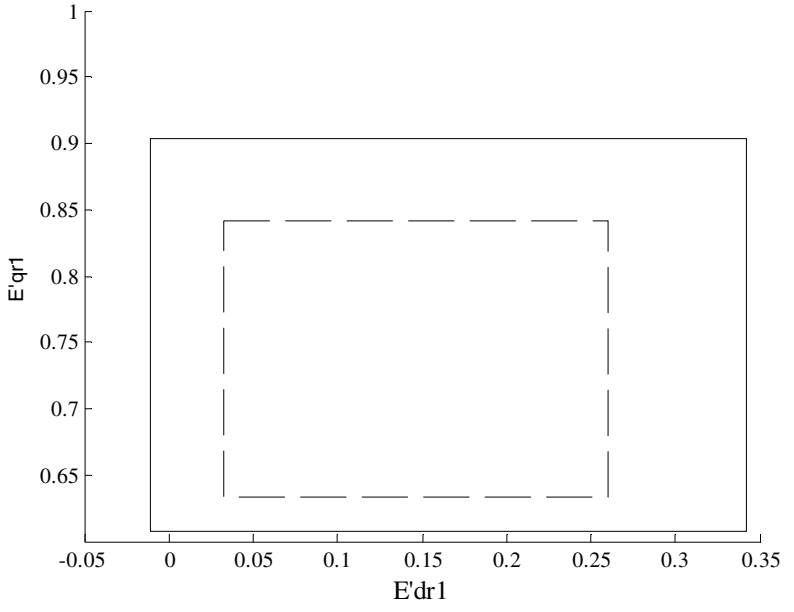

Fig. 13.11(a) D-axis vs q-axis transient emf

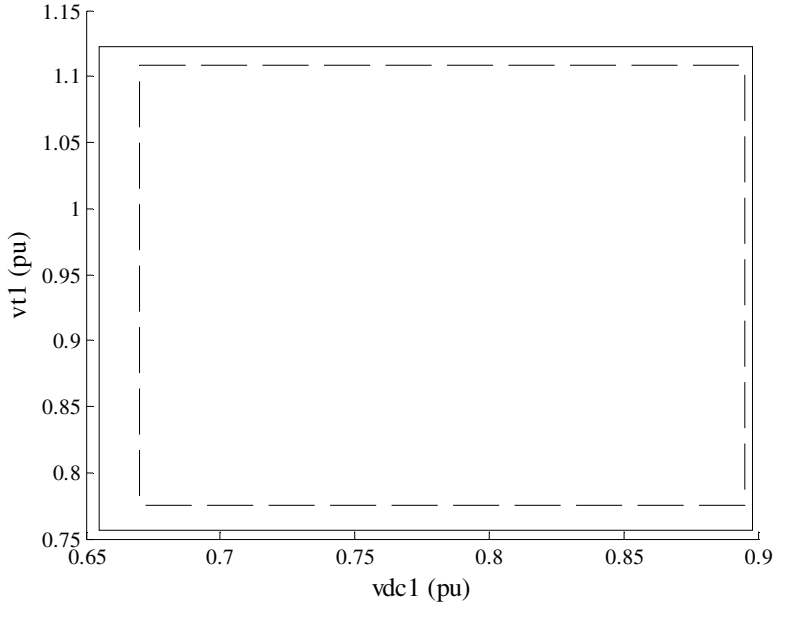

Fig. 13.11(b) Capacitor voltage vs terminal voltage

Fig. 13.11 Operating and control region (Solid line control region and dash line operating region during LVRT transient)

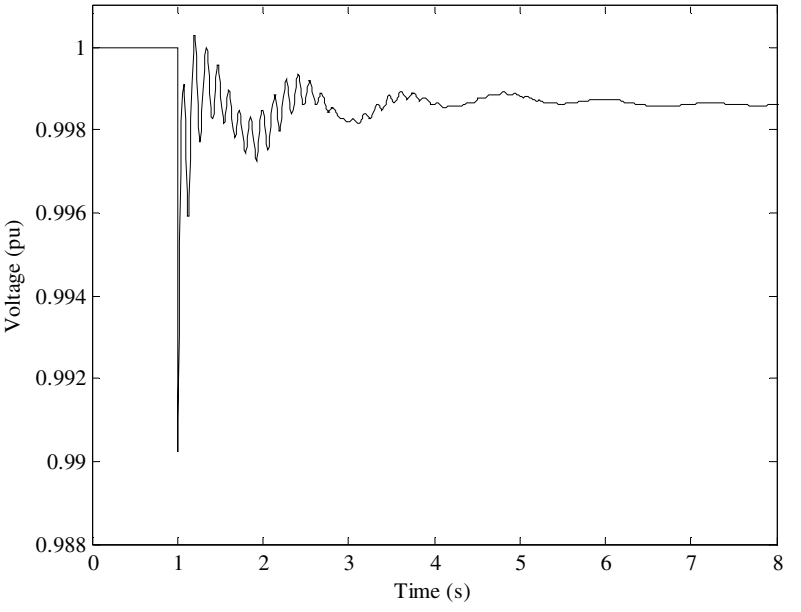

Fig. 13.12(a)

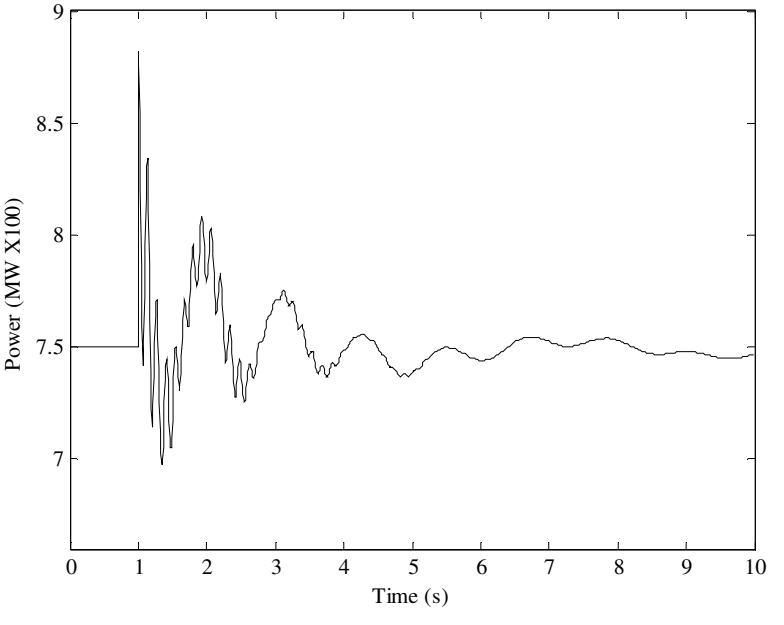

Fig. 13.12(b) Voltage and real power output for 10% increase in load

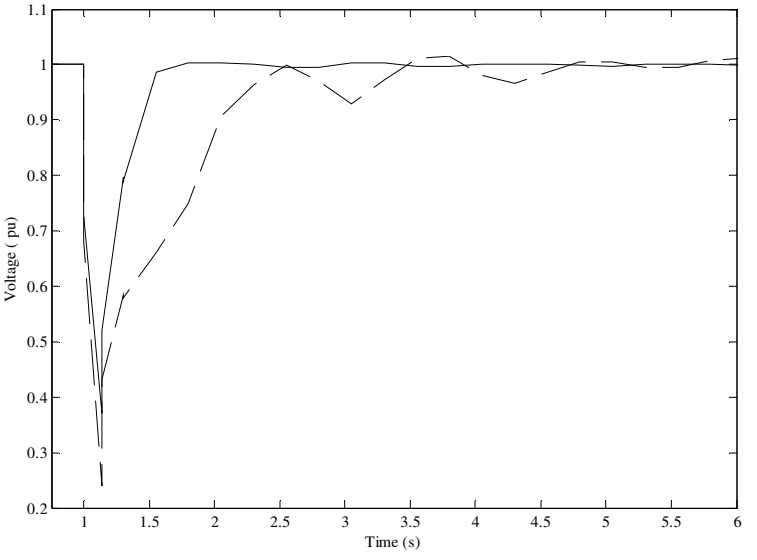

Fig. 13.13 (a)

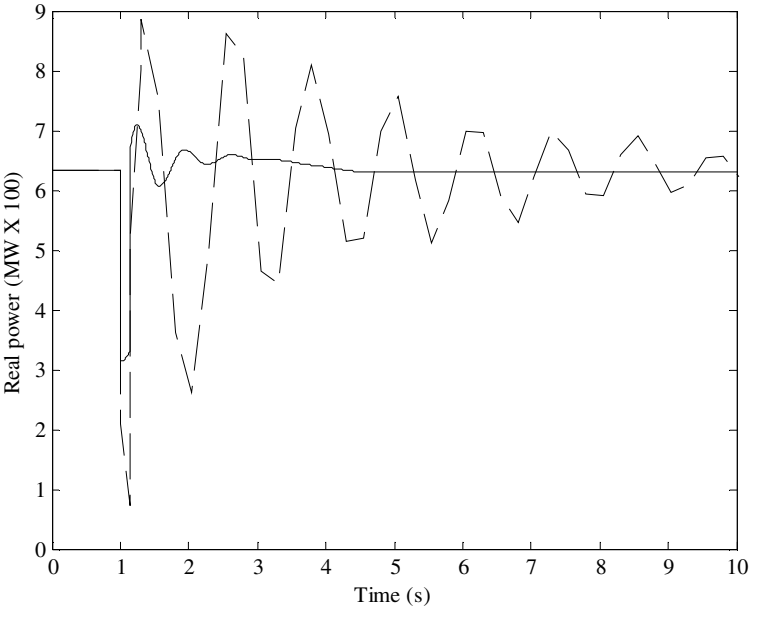

Fig. 13.13(b) Voltage and real power output for a three-phase fault on line 16--17. (Solid line designed STATCOM/ESS controller and dash line STATCOM without ESS controller)

Chapter 20

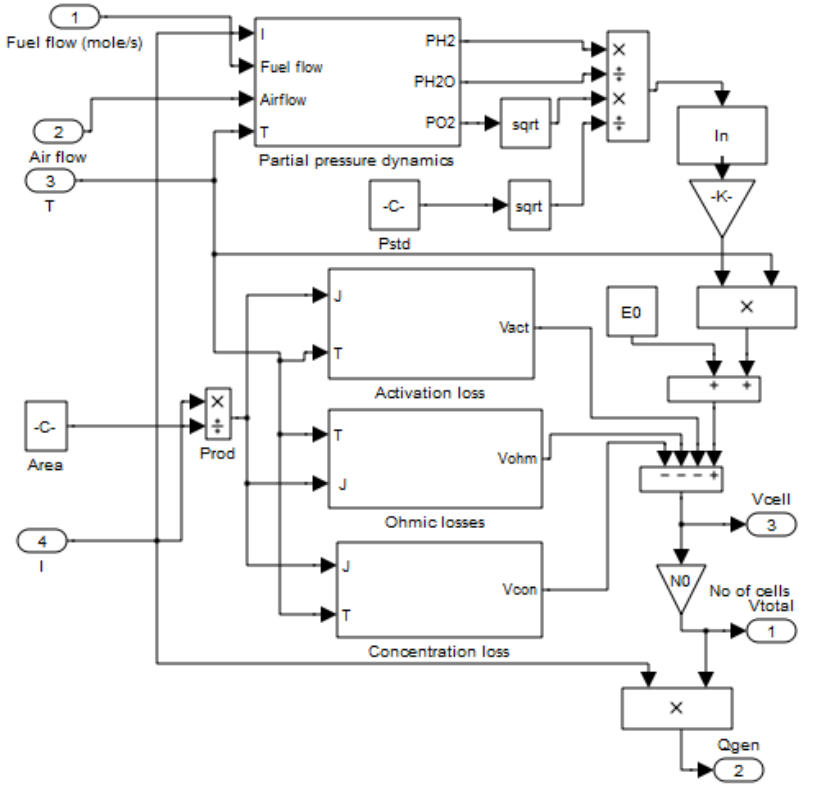

Fig. 20.6 Electrochemical Block

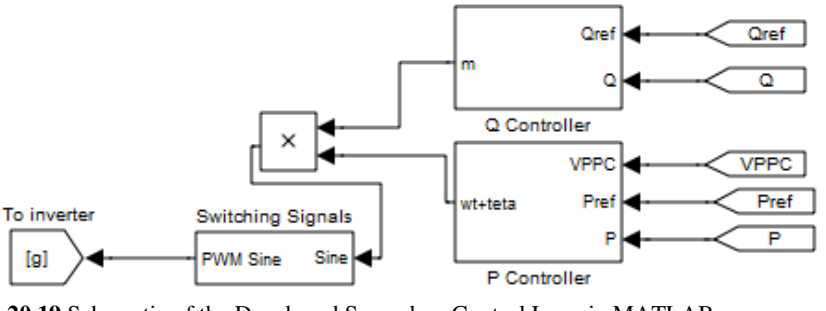

Fig. 20.19 Schematic of the Developed Secondary Control Loop in MATLAB

The online version of the original chapters can be found at
doi: http://dx.doi.org/10.1007/978-3-642-21578-0_10 ,
doi: http://dx.doi.org/10.1007/978-3-642-21578-0_13 and
doi: http://dx.doi.org/10.1007/978-3-642-21578-0_20
