APPENDIX (A)

A.1 System details
File name: busno.dat

3	---> Slack bus number.
0.001	---> Load flow convergence tolerance.
10	---> Number of buses in the system.
11	---> Number of lines.
4	---> Number of transformers.
3	---> Number of PV buses = (Number of generators - 1).
0	---> Q-bit (please set this bit to zero only).
2	---> Number of load buses (including loads at PV and slack buses).
2	---> Number of shunts.
1.03	---> Slack bus voltage magnitude.
60	---> Nominal frequency in Hz.

A.2 Network data:
File name: nt.dat

From	To	R	X	B (total)/Tap ratio	Remarks
9	10	0.022	0.220	0.330	---Line 1
9	10	0.022	0.220	0.330	---Line 2
9	10	0.022	0.220	0.330	---Line 3
9	6	0.002	0.020	0.030	---Line 4
9	6	0.002	0.020	0.030	---Line 5
10	8	0.002	0.020	0.030	---Line 6
10	8	0.002	0.020	0.030	---Line 7
5	6	0.005	0.050	0.075	---Line 8
5	6	0.005	0.050	0.075	---Line 9
7	8	0.005	0.050	0.075	---Line 10
7	8	0.005	0.050	0.075	---Line 11
1	5	0.001	0.012	1.000	---> Transformer data starts here.
2	6	0.001	0.012	1.000	
3	7	0.001	0.012	1.000	
4	8	0.001	0.012	1.000	

A.3 Generation and load data:
File name: pvpq.dat

Bus No.	Vg/PL0	Pg0/QL0	Remarks
1	1.03	7.00	---> Generator buses other than the
2	1.01	7.00	slack bus are specified as PV buses
4	1.01	7.00	
9	11.59	2.12	---> Load data starts here (including
10	15.75	2.88	loads at PV and slack buses)

A.4 Shunt admittances:
File name: shunt.dat

Bus No.	G	B
9	0.0	3.0
10	0.0	4.0

A.5 Converged load flow results:
File name: lfl.dat

Bus No.	Vb0	theta0	Pg0	Qg0	PL0	QL0
1	1.030000	8.215523	7.000000	1.338523	0.00	0.00
2	1.010000	-1.503809	7.000000	1.591791	0.00	0.00
3	1.030000	0.000000	7.217178	1.446427	0.00	0.00
4	1.010000	-10.204916	7.000000	1.807834	0.00	0.00
5	1.010800	3.661654	0.000000	0.000000	0.00	0.00
6	0.987533	-6.243121	0.000000	0.000000	0.00	0.00
7	1.009533	-4.697706	0.000000	0.000000	0.00	0.00
8	0.984958	-14.944164	0.000000	0.000000	0.00	0.00
9	0.976120	-14.419101	0.000000	0.000000	11.59	2.12
10	0.971659	-23.291847	0.000000	0.000000	15.75	2.88

A.6 Load data:
File name: ld.dat

Load Bus No.	PL0	QL0
9	11.59	2.12
10	15.75	2.88

A.7 Generator data (six model):
File name: gen.dat

Gen.No.	xd	xdd	xddd	Td0d	Td0dd	xq	xqd	xqdd	Tq0d	Tq0dd	H	D
1	0.2	0.033	0.0264	8.0	0.05	0.190	0.061	0.03	0.4	0.04	54	0
2	0.2	0.033	0.0264	8.0	0.05	0.190	0.061	0.03	0.4	0.04	54	0
3	0.2	0.033	0.0264	8.0	0.05	0.190	0.061	0.03	0.4	0.04	63	0
4	0.2	0.033	0.0264	8.0	0.05	0.190	0.061	0.03	0.4	0.04	63	0

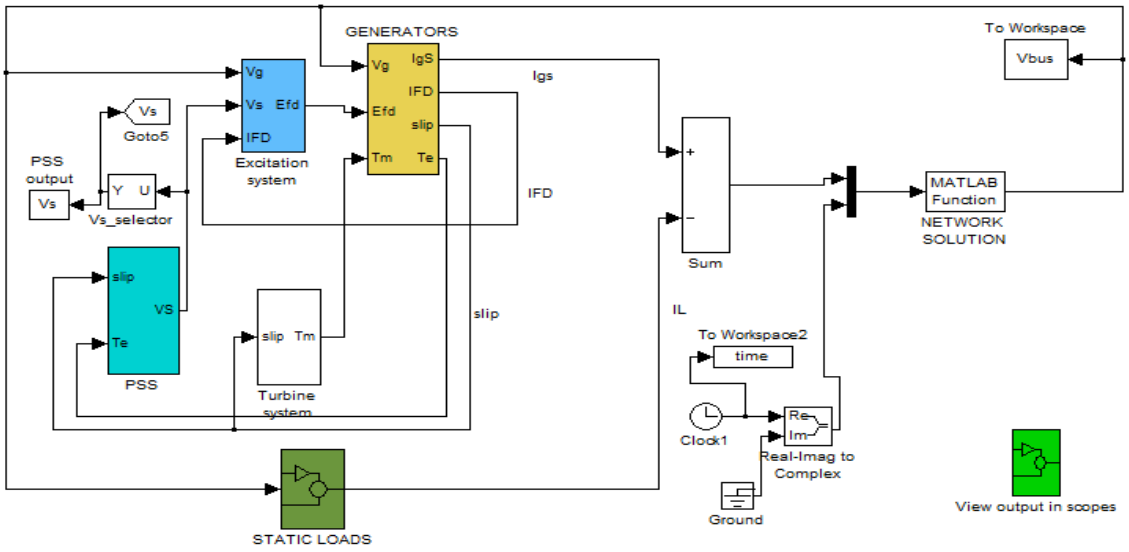
A.8 Single-time constant static exciter:
File name: exc_static.dat

Gen.no.	KA	TA	EFDMIN	EFDMAX
1	200	0.02	-6.0	6.0
2	200	0.02	-6.0	6.0
3	200	0.02	-6.0	6.0
4	200	0.02	-6.0	6.0

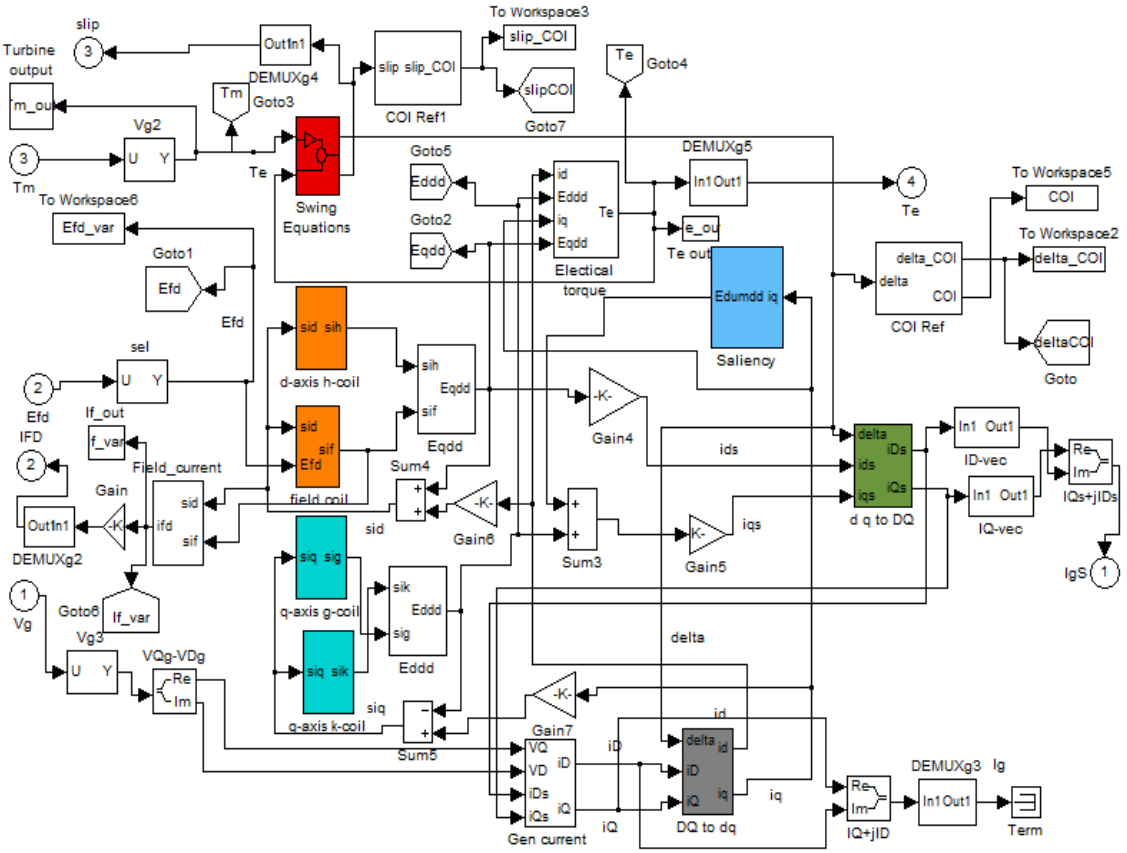
APPENDIX (B)

The Simulink Blocks

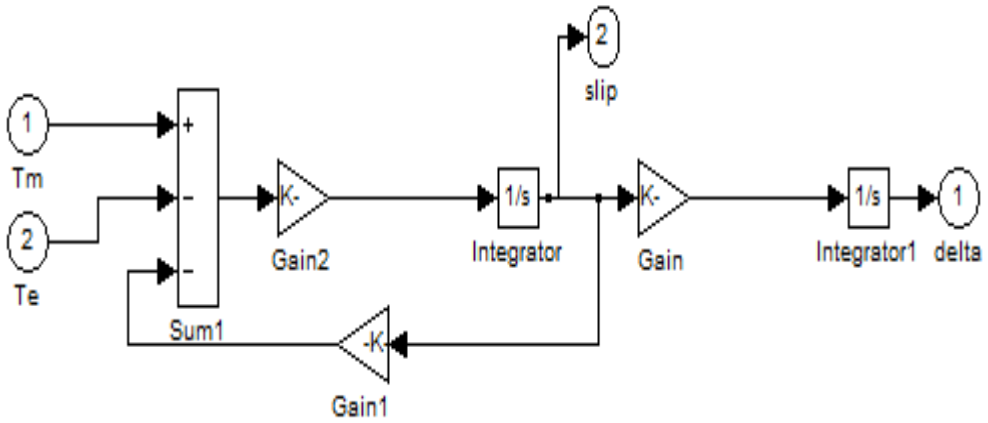
B.1 The system (two area four machines)



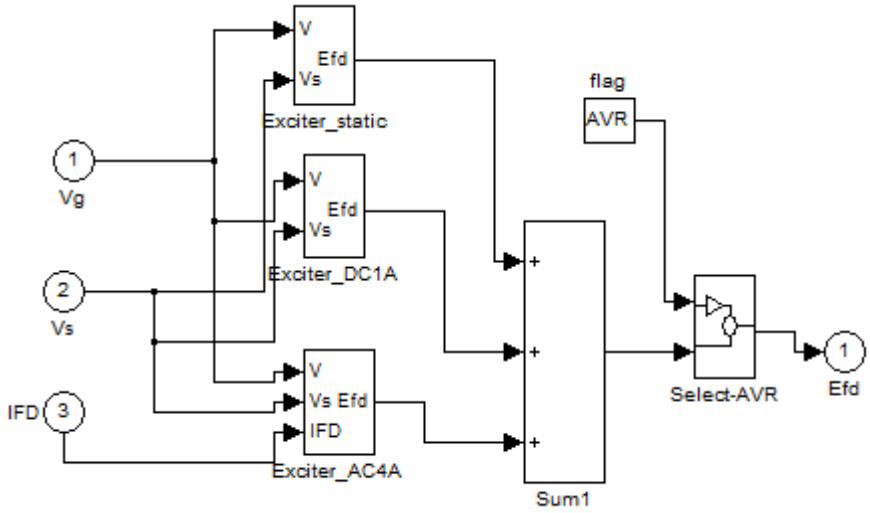
B.2 Generators



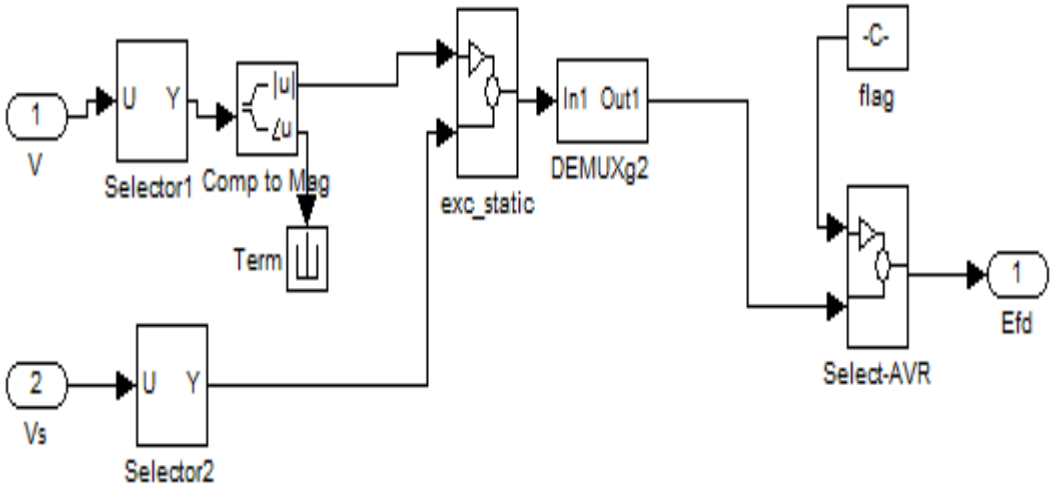
B.3 Swing Equation



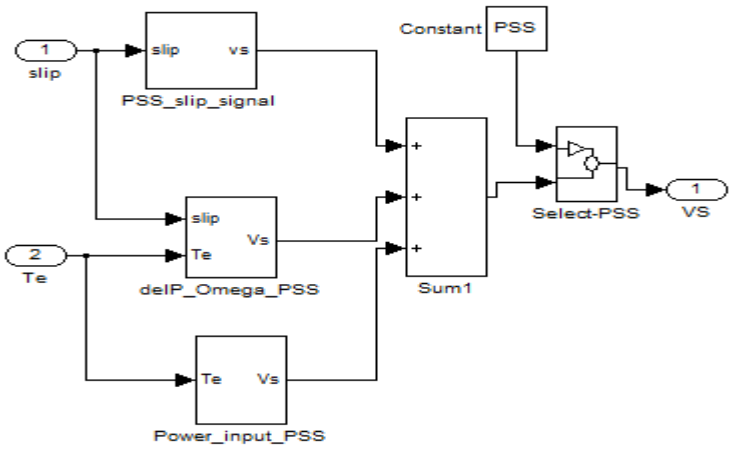
B.4 Excitation system



B.5 Static Excitation System



B.6 The power system stabilizer (PSS)



B.7 Slip Signal PSS