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Supplementary materials for

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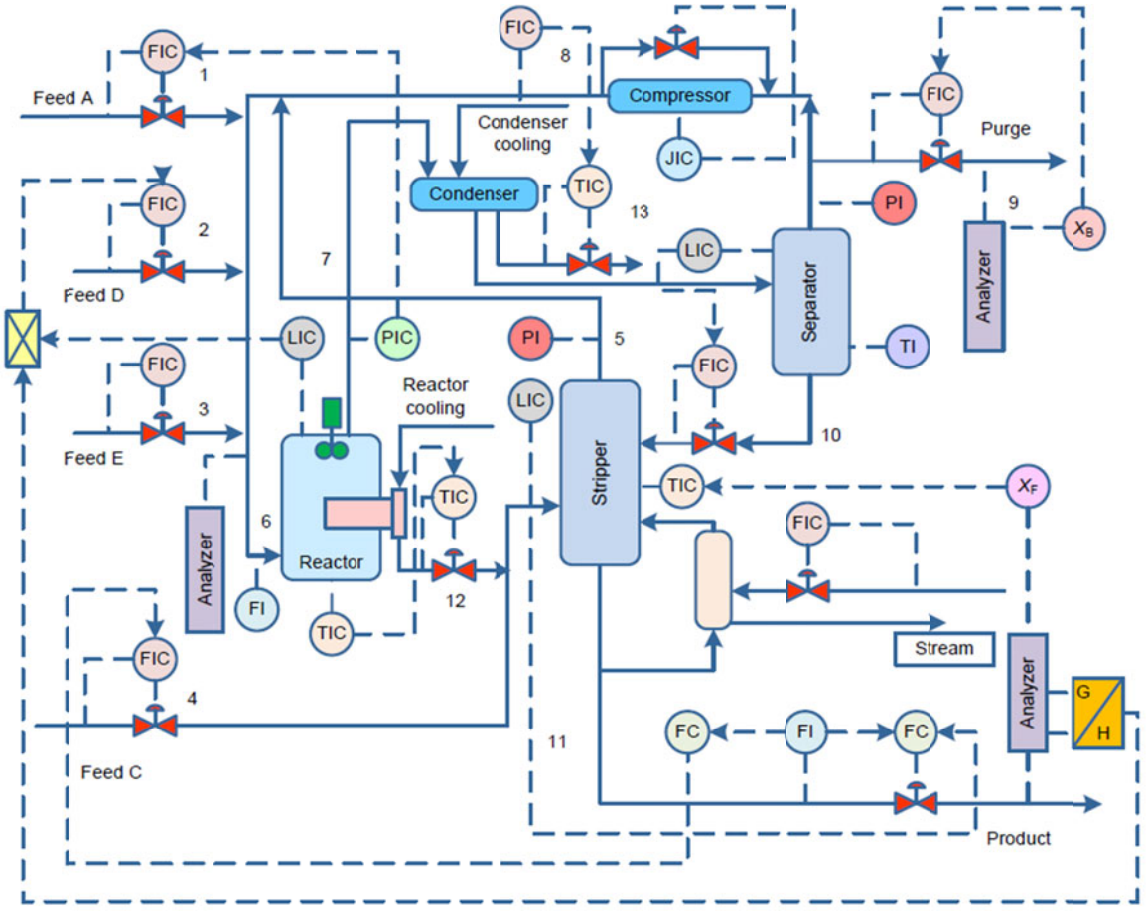

Fig. S1 Tennessee Eastman process (TEP)

Table S1 Selected measured variables for monitoring

No.	Measured variable	No.	Measured variable
1	A feed rate	22	Condenser coolant temperature
2	D feed rate	23	Feed% A
3	E feed rate	24	Feed% B
4	A and C feed rate	25	Feed% C
5	Recycle flow rate	26	Feed% D
6	Reactor feed rate	27	Feed% E
7	Reactor pressure	28	Feed% F
8	Reactor level	29	Purge% A
9	Reactor temperature	30	Purge% B
10	Purge rate	31	Purge% C
11	Separator temperature	32	Purge% D
12	Separator level	33	Purge% E
13	Separator pressure	34	Purge% F
14	Separator underflow	35	Purge% G
15	Stripper level	36	Purge% H
16	Stripper pressure	37	Product% D
17	Stripper underflow	38	Product% E
18	Stripper temperature	39	Product% F
19	Stem flow rate	40	Product% G
20	Compressor work	41	Product% H
21	Reactor coolant temperature		

Table S2 Selected manipulated variables for monitoring

No.	Manipulated variable
1	D feed flow (stream 2)
2	E feed flow (stream 3)
3	A feed flow (stream 1)
4	A and C feed flow (stream 4)
5	Compressor recycle valve
6	Purge valve (stream 9)
7	Separator pot liquid flow (stream 10)
8	Stripper liquid product flow (stream 11)
9	Stripper steam valve
10	Reactor cooling water flow
11	Condenser cooling water flow

Table S3 Twenty-two operating conditions simulated in TEP

No.	Description	Type
0	Normal operation	
1	A/C feed ratio, B composition constant (stream 4)	Step
2	B composition, A/C ratio constant (stream 4)	Step
3	D feed temperature (stream 2)	Step
4	Reactor cooling water inlet temperature	Step
5	Condenser cooling water inlet temperature	Step
6	A feed loss (stream 1)	Step
7	C header pressure loss-reduced availability (stream 4)	Step
8	A, B, C feed composition (stream 4)	Random variation
9	D feed temperature (stream 2)	Random variation
10	C feed temperature (stream 4)	Random variation
11	Reactor cooling water inlet temperature	Random variation
12	Condenser cooling water inlet temperature	Random variation
13	Reaction kinetics	Slow drift
14	Reactor cooling water valve	Sticking
15	Condenser cooling water valve	Sticking
16	Unknown	
17	Unknown	
18	Unknown	
19	Unknown	
20	Unknown	
21	The valve for stream 4 was fixed at the steady state position	Constant position